

# Railway Maintenance Engineer

Volume 18

CHICAGO—JANUARY, 1922—NEW YORK

Number 1

NO CREEPING RAILS

On This Bridge

Rail Anti-Creeping Work

THE P. & M. CO.

CHICAGO  
ST. LOUIS  
PAUL

NEW YORK  
BOSTON  
PHILADELPHIA

THE  
P. & M. CO.

CO. MONTREAL

J. BUDGE HOWE & SONS





## INTERNATIONAL STEEL CROSSING FOUNDATIONS

### vs. HEAVY DRIVERS

When the 8,000 pound moving load of each big driver of a heavy locomotive bumps over the flangeway of a crossing supported on a Steel Crossing Foundation even a section hand can see the difference. The racking, twisting shocks are absorbed by the oak timbers and spread over the ballast on more square feet of bearing than can be obtained in any other way.

International Steel Crossing Foundations are now being built heavier throughout. They are riveted with  $\frac{3}{4}$ " rivets; filled with hard oak timbers and have a proven fastening method. All plates are  $\frac{1}{2}$ " thick and the channels are 7" x 14.75 pounds.

If your road cannot specify now, recommend the use of Steel Crossing Foundations to intersecting Electric Railways who must save money.

A proposal plan will be sent on request.

# The International Steel Tie Company

CLEVELAND, OHIO

# RAILS

**Commencing March, 1922**

Standard Section Rails will be produced at our Indiana Harbor Works from Basic Open Hearth Steel.

Inland quality control from raw materials through final inspection insures maximum safety.

## **TRACK ACCESSORIES**

Splice Bars—Heat Treated  
Tie Plates

Track Bolts—Heat Treated  
Track Spikes

# **INLAND**

**BASIC OPEN HEARTH**

# **STEEL PRODUCTS**

**BILLETS BARS PLATES SHAPES SHEETS**

## **INLAND STEEL COMPANY**

**38 South Dearborn St., Chicago**

### **Works:**

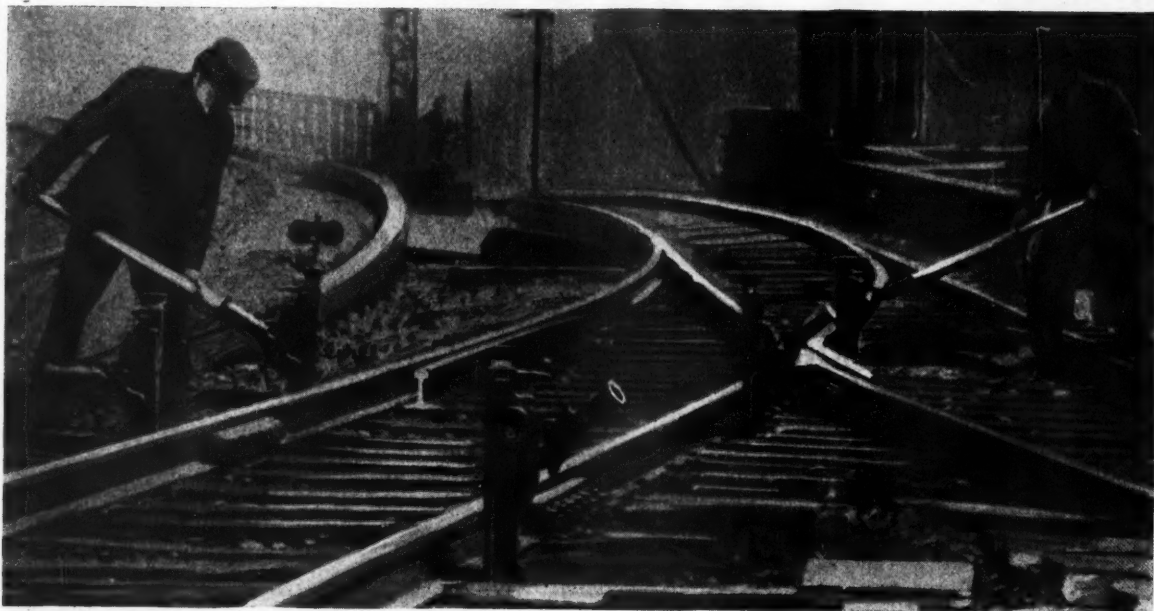
Indiana Harbor, Ind.  
Chicago Heights, Ill.

### **Branch Offices:**

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St. Louis, Mo.  
St. Paul, Minn.



# DUFF JACKS



## Wherever Rails of Steel Are Laid

there you find the genuine Barrett track jacks, first with the pioneers, and later with the repair gangs. For over 30 years the Barrett No. 1 has been the King of Track Jacks, and has been more widely imitated than perhaps any other tool used by the railroad worker. With its most recent improvements, the genuine Barrett is maintaining an easy lead in strength, convenience and low repair cost.

*Send for Special Track Jack Bulletin*

**The Duff Manufacturing Co.**

*Established 1883*

**PITTSBURGH, PA.**

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Peoples Gas Bldg.  
Chicago, Ill.

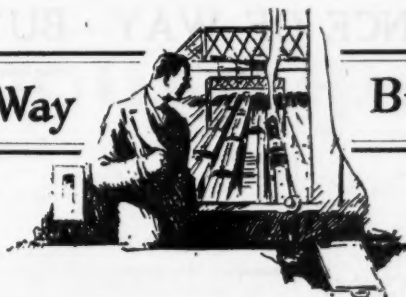
Candler Bldg.  
Atlanta, Ga.

Railway Exchange Bldg.  
St. Louis, Mo.

Monadnock Bldg.  
San Francisco, Cal.



## Maintenance of Way



## Buyers' Guide

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<b>Anti-Creepers.</b> P. & M. Co., The	<b>Bolts.</b> Bethlehem Steel Company.	<b>Coaling Stations.</b> Des Moines Bridge & Iron Co.	<b>Cutting, Oxy-Acetylene.</b> Air Reduction Co., Inc.	<b>Explosives.</b> E. I. du Pont de Nemours & Co.
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<b>Asphalt Shingles.</b> Ruberoid Co., The	<b>Building Papers.</b> Ruberoid Co., The	<b>Crane, Wrecking.</b> Bucyrus Company.	<b>Dredges.</b> Bucyrus Company. Des Moines Bridge & Iron Co. Pittsburgh-Des Moines Steel Co.	<b>Float Valves.</b> American Valve & Meter Co. Golden-Anderson Valve Specialty Co.
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<b>Barrels.</b> Diamond State Fibre Co.				

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**Forge Hammers.**  
Sullivan Machinery Co.

**Frogs.**  
Bethlehem Steel Company.  
Frog, Switch & Mfg. Co.  
Ramapo Iron Works.  
St. Louis Frog & Switch Co.  
Weir Frog Co.  
Wm. Wharton, Jr., & Co.

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Air Reduction Co., Inc.

**Gas, Acetylene.**  
Air Reduction Co., Inc.

**Gears.**  
Diamond State Fibre Co.

**Generators, Acetylene.**  
Air Reduction Co., Inc.

**Girder Rail.**  
Bethlehem Steel Company.

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**Grinders (Portable).**  
Ingersoll-Rand Co.

**Guard Rails.**  
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Ramapo Iron Works.  
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American Chain Co., Inc.  
Q. & C. Company.  
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Weir Frog Co.

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**Hand Car Engines.**  
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Rail Joint Co.

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Air Reduction Co., Inc.

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New Jersey Zinc Co.  
Ruberoid Co., The.

**Penells.**  
Jos. Dixon Crucible Co.

**Penstocks.**  
American Valve & Meter Co.

**Pig Iron.**  
Bethlehem Steel Company.

**Pile Drivers.**  
Bucyrus Company.

**Piling.**  
Massey Concrete Prod. Corp.

**Pinions.**  
Diamond State Fibre Co.

**Pipe, Cast Iron.**  
American Casting Co.

**Pipe, Concrete.**  
Massey Concrete Prod. Corp.

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Massey Concrete Prod. Corp.

**Pipe Joint Compound.**  
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Ruberoid Co., The.

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Pittsburgh-Des Moines Steel Co.

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Air Reduction Co., Inc.

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Ingersoll-Rand Co.

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Sullivan Machinery Co.

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**Rail Anchors.**  
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P. & M. Co., The.

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Fairbanks, Morse & Co.  
Q. & C. Company.

**Rail Braces.**  
Bethlehem Steel Company.  
Q. & C. Company.

**Rail Braces.**  
Bethlehem Steel Company.  
Q. & C. Company.  
Ramapo Iron Works.  
Weir Frog Co.

**Rail Joints.**  
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**Rail Joint Co.**  
Wm. Wharton, Jr., & Co.

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Air Reduction Co., Inc.

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Air Reduction Co., Inc.

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**Sewer Pipe Seal Compound.**  
Ruberoid Co., The.

**Sheets, Fibre.**  
Diamond State Fibre Co.

**Sheet Iron.**  
Armco Culvert & Flume Mfrs. Assn.

**Sheet Steel.**  
Inland Steel Company.

**Shovels.**  
Wood Shovel and Tool Co., The.

**Signal Foundations, Concrete.**  
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**Skid Shoes.**  
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Massey Concrete Prod. Corp.  
Pittsburgh-Des Moines Steel Co.

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**Snow Plows.**  
Q. & C. Company.

**Spikes.**  
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**Spreader Plows.**  
Bucyrus Company.

**Standard Tee Rails.**  
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**Standpipes.**  
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Pittsburgh-Des Moines Steel Co.

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Des Moines Bridge & Iron Co.  
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Chicago Steel Post Co.

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Wood Shovel and Tool Co., The.

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Weir Frog Co.

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**Torches, Blow Combination.**  
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**Trestle Slabs.**  
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**Valves.**  
Golden-Anderson Valve Specialty Co.

**Varnish, Electrical Insulating.**  
Ruberoid Co., The.

**Washers.**  
Diamond State Fibre Co.

**Water Columns.**  
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**Waterproofing.**  
Ruberoid Co., The.

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Golden-Anderson Valve Specialty Co.

**Water Tanks.**  
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Pittsburgh-Des Moines Steel Co.

**Welding, Oxy-Acetylene.**  
Air Reduction Co., Inc.

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Armco Culvert & Flume Mfrs. Assn.

**Wire Rope.**  
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Bucyrus Company.

**Zinc Chloride.**  
New Jersey Zinc Co.

# Continuous Operation



## Makes Work Equipment Pay

The scientific design and rugged construction of the

### Bucyrus Spreader Plow

keeps it on the job, day after day, even under the most difficult operating conditions, doing work no other Spreader Plow can do.

Built to the highest standards of work equipment, it stands the knocks and works continuously under the most adverse conditions.

Meets the average requirements of the average job—and the unusual requirements of the unusual job.

Shouldering, ditching, double tracking, spreading, flanging, plowing, bank building, bank trimming, etc., it will work in stiffer material and at greater operating ranges than has been possible heretofore.

SEND FOR BULLETIN SP-D

## BUCYRUS COMPANY

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Chicago,

Minneapolis,

Birmingham,

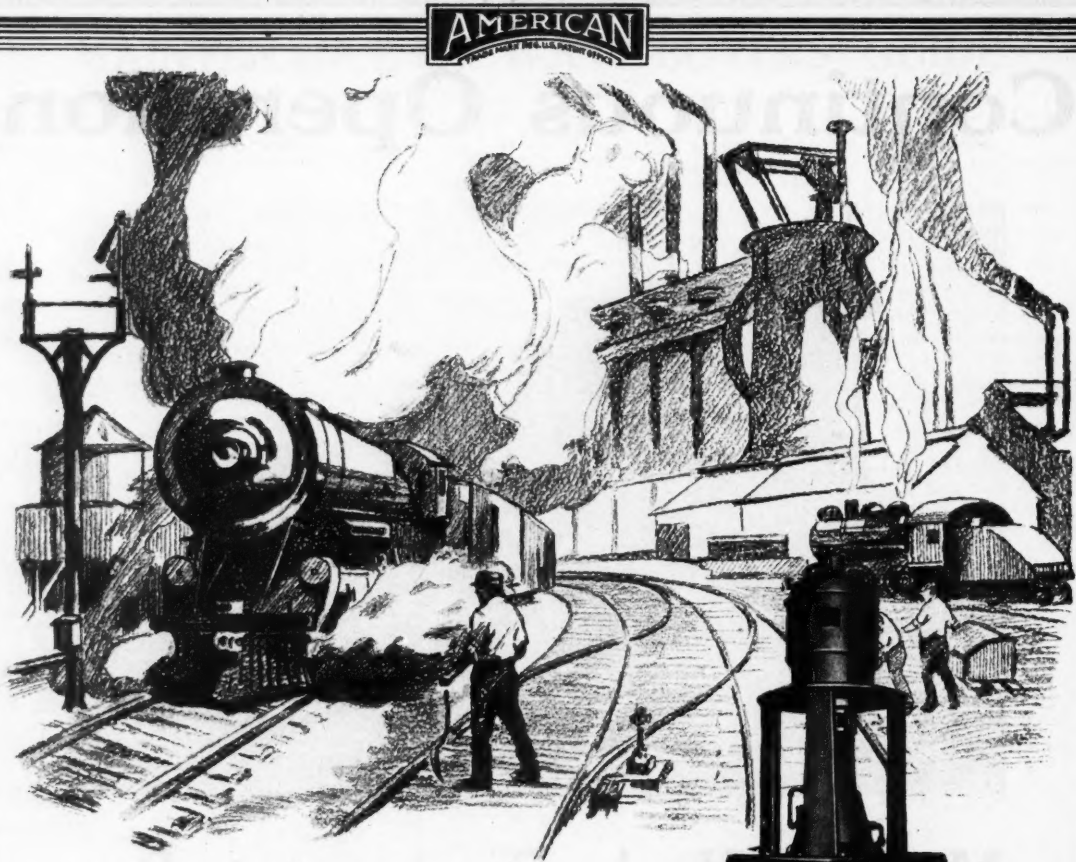
Denver,

San Francisco,

Portland, Ore.,

Salt Lake City.

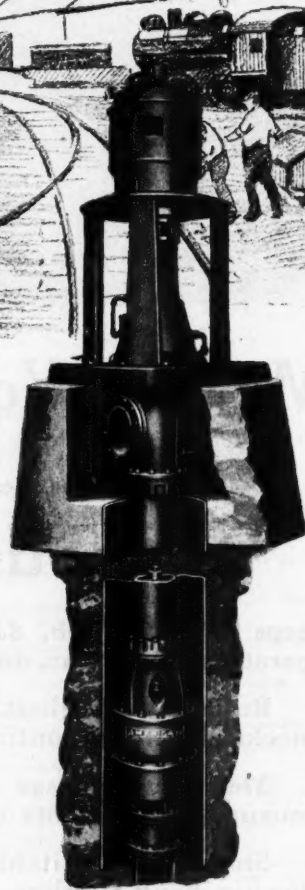




## *What Is the Reason?*

Naturally there are a great many local conditions that affect the choice of a pump—but there must be some reason why many railroad engineers insist that no matter what the type of centrifugal used—it must bear the name plate of The American Well Works.

Fifty years of experience as manufacturers of all types of centrifugal pumps, deep well plunger pumps, and deep well turbines assures their satisfactory performance.



# THE AMERICAN WELL WORKS

General Office and Works  
**AURORA, ILL.**

Chicago Office  
FIRST NATIONAL BANK BLDG.

# Save Time in filling your tenders Prevent damage from Water Hammer

WITH THE  
**POAGE Style H  
WATER  
COLUMN**



## An Instantly Adjustable Spout

Quicker work in filling tender tanks is possible with the Poage Style H Water Column equipped with the Fenner drop spout.

A vertical range of five feet and a lateral range of three feet make accurate spotting of the tender unnecessary.

The spout works equally well with tenders of different heights.

The spout avoids the usual winter troubles in cold climates. It has a non-freezable telescopic joint. This is entirely open. There is no packing of any sort. Yet it does not leak or waste a drop of water.

## Quick Closure Without Water Hammer

Even on high pressure water mains, the Poage Style H Valve is closed quickly without danger to the mains from water hammer. The flow is cut down 85 per cent very rapidly and the remaining 15 per cent more slowly.

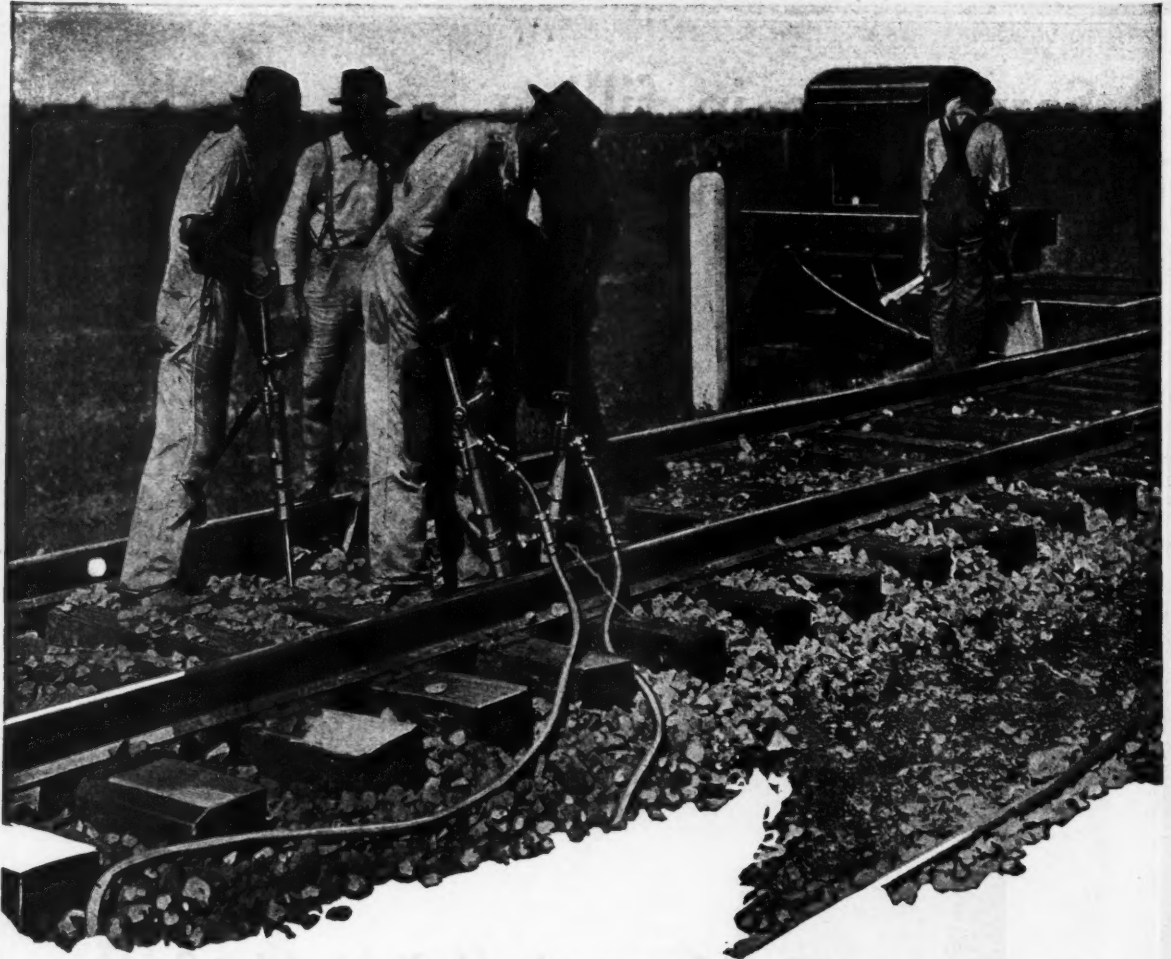
Tests by the University of Illinois have shown that this principle provides the quickest closure and makes water hammer impossible.

Investigate the Poage Style H water column. Give it a thorough trial.

*Manufactured exclusively by*

# The AMERICAN VALVE & METER CO.

*Cincinnati, Ohio*



## I-R Products

Rail Bonding Drills  
 Rail Drills  
 Angle Bar Bolters  
 Wood Borers  
 Air Drills and Reamers  
 Riveting Hammers  
 Chipping Hammers  
 Pneumatic Grinders  
 Rock Drills  
 Air Compressors  
 Aftercoolers  
 Condensers  
 Oil Engines  
 Cameron Pumps

## "IMPERIAL" PNEUMATIC TIE TAMPERS Reduce Track Costs

Four men with "Imperial" Tampers can tamp more track in one day and do a better job than sixteen (16) men with picks and bars. Pneumatic tampers make a smoother and more lasting roadbed.

Actual track records show that "Imperial" tamped track lasts on the average two to three times as long as hand tamped track.

*Send for Catalog 9123 describing "Imperial" Tamping Outfits and their uses.*

### Ingersoll Rand Company

General Offices: 11 Broadway, New York

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 Boston  
 Butte  
 Chicago  
 Cleveland  
 Denver

Detroit  
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 Dallas  
 El Paso  
 Houghton  
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 New York  
 Philadelphia

Pittsburgh  
 Salt Lake City  
 San Francisco  
 Scranton  
 Seattle  
 St. Louis

# Ingersoll-Rand





## Here is an unusual photograph

—that furnishes convincing proof of the staunchness of Armco Culverts. This culvert not only sustained the weight of its projecting end when filled with ice, but also bore the weight of the enormous icicle that slowly increased in size until its lower end reached the ground. No culvert of any other form of construction could withstand such a test as this.

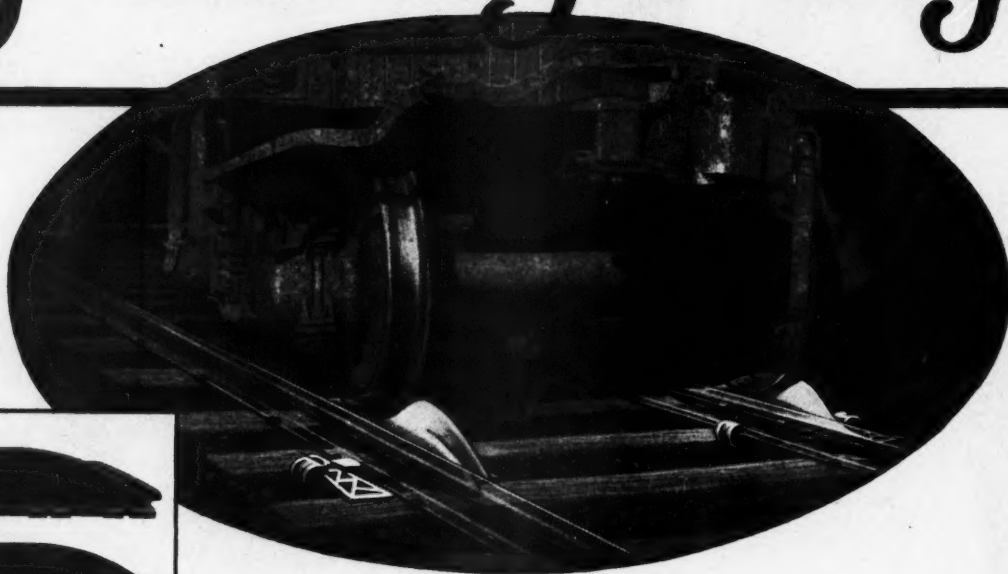
In our files are many photographs which, in one way or another, demonstrate the strength of Armco Culverts. Few of them indeed are as striking as this one, but collectively they prove beyond the shadow of a doubt that Armco Culverts will withstand both the usual and unusual demands of drainage service. Whether you buy culverts for portability, ease of installation, or long service, you get all three when you specify Armco.



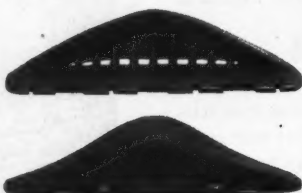
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# Railway Maintenance Engineer

Vol. 18

January, 1922

Number 1

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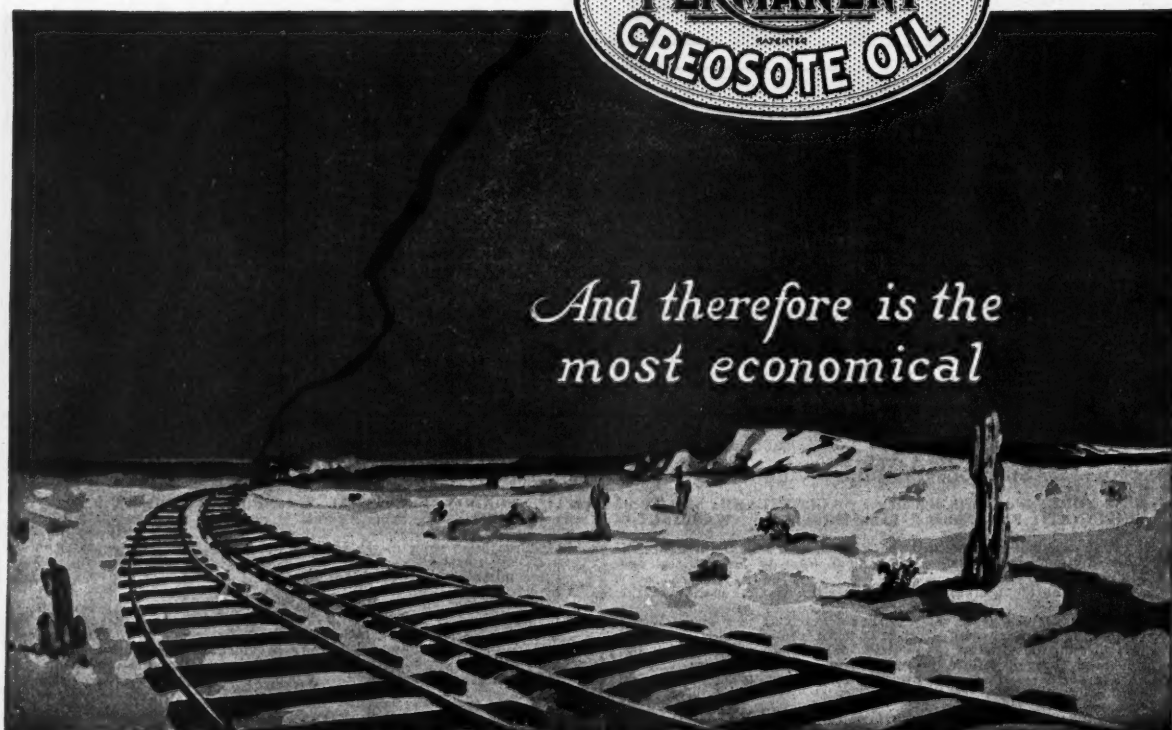
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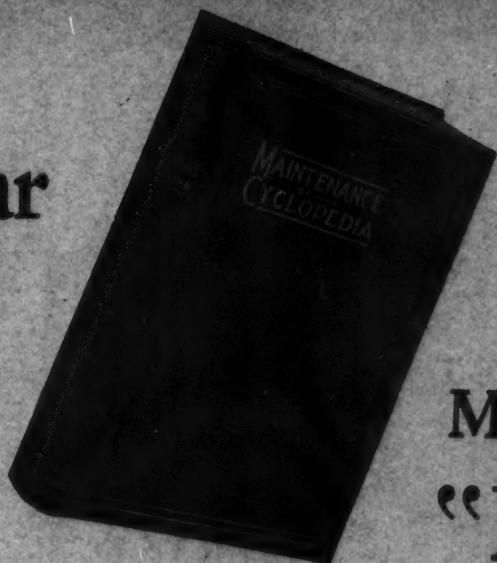
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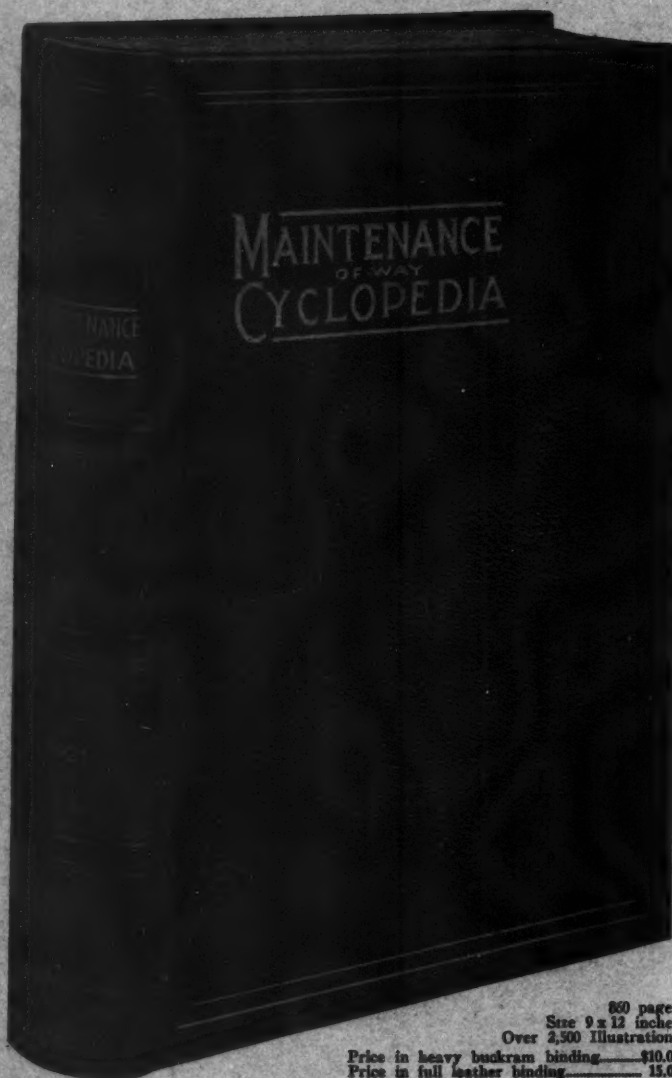
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# Railway Maintenance Engineer

Readers of the *Railway Maintenance Engineer* who have followed the fortunes of the "What's the Answer" department

## The "What's the Answer" Department

will notice a change in this month's issue not only in appearance but also in the plan under which this department is conducted. Besides publishing a larger number of questions, it has been found advisable to give answers to the questions in the issue immediately following that in which the question was submitted rather than waiting for two months. Experience has shown that readers who answer these questions almost invariably have their replies in the editor's hands in plenty of time for use in the following issue. It is also believed that greater interest will be secured through the more prompt presentation of the solutions of the problems submitted.

An interesting method of erecting deck plate girder spans to replace through truss spans without the use of falsework is described on another page of this issue. The plan is by no means new, but the methods by which it was carried into effect are well worth study by those who encounter problems of this kind. Briefly, the process consisted in delivering the girders on cars directly over their final position, suspending them from the top chords of the trusses so that the cars could be released and then cutting away the floor system of the old span so that the girders could be lowered on to the bearings. It is not out of place to call attention to the fact that the old bridge was double track, thus affording certain advantages in the erection which would not be obtained in a single track structure, particularly if it was to be replaced by a double track bridge. With the trusses designed for double track, there was sufficient space between them to permit of the delivery of the new girders for both tracks in exact position for lowering into their final place. The double track trusses also afforded a reserve strength, for, although they were required to carry the girders for each track simultaneously, the erection plan required the presence of equipment on one track only. This method of erection was also greatly facilitated by the use of the oxy-acetylene torch to cut away the old metal.

There are few subjects on which there are greater differences of opinion among maintenance of way men than that of awarding prizes for superior work. This was evidenced in the spirited discussion of the report on this subject at the last convention of the Roadmasters' Association. It is also indicated in a letter to the editor published in this issue. It is contended by the opponents of this practice that it is impossible to award the prizes to those men entitled to them because of the difficulty in making proper allowances for varying conditions of sub-grade, rail, ballast, drainage, etc., all of which influence the riding qualities of track. It is further argued that the desire to win the prize causes the foreman to slight those details which cannot be detected at once. However, the experiences of those roads whose annual premium awards are given elsewhere in this issue tends to disprove these fears, or rather to demonstrate that the advantages outweigh the disadvantages. Some of these railways have followed

## The Premium System

this practice continuously for more than a quarter of a century and it stands to reason that they would not have done so if they had not found that it was of advantage. The idea underlying this system is that all men are spurred on by the desire to excel and that any attempt to measure the results of their work will cause them to exert special efforts. Any system which will cause men to take a greater interest in their work and exert special efforts is of obvious advantage. For this reason the development of a system of prize awards which will develop this incentive to the maximum, but will at the same time contain the minimum disadvantages, is worthy of careful consideration by all maintenance men.

Insofar as high grade main lines are concerned, the controversy between the advocates of the square and the staggered rail joints has passed into history. The superiority of the staggered point from the standpoints of riding qualities, economy of maintenance and operation, is thoroughly established and it is only a question of time before the last vestige of this practice, as it concerns well-maintained track, will have become a thing of the past. In the case of yard tracks, the situation is in a sense reversed in that there are probably some yard tracks now laid with staggered joints which would serve their purpose better if the joints were square. In fact, this change was made recently in one large terminal with excellent results, as the tracks now ride better and are more easily maintained. There is less tendency for the traffic to throw the track out of line at the joints and the spike-plotted joints are found to be much more effective in the prevention of creeping where the joint ties were thoroughly secured at both ends. One difficulty in the way of obtaining square joints in yard tracks arises from the fact that much of the second-hand rail used for this purpose is in short or odd lengths, but this can be overcome by a more careful distribution of the rail. There are, of course, arguments on both sides, but the point for the maintenance officer to consider is that, unlike the case of important main tracks, there is still considerable room for argument as regards square and staggered joints in yards.

## Square Joints or Staggered

The officers of any railroad which has suffered from an epidemic of transverse fissure rail failures and who have in consequence given the subject any attention have learned that these failures have occurred in greater prevalence in the rails rolled in certain years or obtained from certain mills. A more intimate study has shown that they may usually be laid at the door of particular heats. Therefore, many of the roads have taken steps to locate all the rails of those mill heats that are showing transverse fissures so that steps may be taken at once to get all of the other rails from the same heats out of main track service. The wisdom of this action has been repeatedly demonstrated, for even when relaid in side tracks these rails will continue to develop the transverse fissures in large numbers. Difficulty in the execution of an order for the removal of all the rails of a heat that is under suspicion arises from the fact that it is not always easy to identify the rails in the track. The heat numbers, particularly in tracks subject to refrigerator traffic, become more or less obliterated

The officers of any railroad which has suffered from an epidemic of transverse fissure rail failures and who have in consequence given the subject any attention have learned that these failures have occurred in greater prevalence in the rails rolled in certain years or obtained from certain mills.

## Keep Track of the Heat Numbers

1.



ated from corrosion. This has led to the suggestion that provision should be made to identify the rails and keep a record of the heat numbers as they are put in the track. Another method is to follow the practice of the Lackawanna, which lays the rails in groups according to heat numbers. The increasing menace of the transverse fissure points to the need for most attention to this subject.

#### WHAT ONE HAS DONE, OTHERS CAN DO

**T**HERE is no greater incentive for a man to exert his best efforts than the knowledge that there is opportunity for advancement. Ambition is the spur for every man. Without it he becomes a drone. Railroad-ing is a great industry which gives opportunity for the display of the best in one. It is highly specialized in its operations, demanding experienced leadership. For this reason its officers must be recruited from the ranks.

One of the most important branches of railway service, both from the number of men employed and the character of the work, is the engineering and maintenance of way department. With the constructive character of its activities and its out-of-door employment, it has much to appeal to the active man and to develop his latent ability. Yet one frequently hears murmurings here as elsewhere in railway service, that there is no longer a chance for the man in the ranks or in a subordinate position. This feeling has caused many ambitious young men to seek other employment and has led others to discontinue striving for recognition. In giving voice to this criticism these men lose sight of the many men who have risen and are still rising to positions of greater responsibility from places in this branch of the service similar to those which they themselves are now holding. It will surprise some to know that railways comprising over one-half of the mileage of the United States and Canada have as chairmen of their boards of directors, presidents, vice-presidents or general managers, officers who have advanced through the maintenance of way department.

As a man rises to higher positions in the industry, all but his early acquaintances lose sight of the fact that he started at the bottom, experienced the discouragements of early years, was "hired and fired" with each succeeding depression and stuck through it all until his opportunity came. It is of such qualities that railway officers are made and will continue to be made.

To bring this phase of the early lives and experiences of men who are now prominent in the railway field to the attention of those who are now in subordinate positions, we publish in this issue the first of a series of sketches of men who entered railway service in the engineering and maintenance of way department and who received

their first recognition there. The subject of the sketch in this issue was himself a roadmaster for several years and rose through various grades to the highest position on one of the most important railway systems of this country. Other articles in this series will describe some of the early experiences of men who have risen to similar positions from bridge gangs, from the water service department, from the engineering corps and from the drafting room.

#### THE NEW NATIONAL AGREEMENT

**N**O AGREEMENT governing the relations of employers and employees under as widely varying conditions as are encountered in a country as large as the United States can possibly meet the approval of all concerned. However, there is reason to believe that the changes embodied in the new agreement for maintenance of way employees which became effective on December 16 will produce economies for the roads at a minimum of disadvantage to the men.

The most important revision is that providing for the payment of straight time for work done by all employees in the maintenance of way department in the ninth and tenth hours. According to the old rules, time and one-half was paid for these two hours to all employees except those in extra gangs. Therefore, considerations of economy compelled the railroads to restrict the day's work to eight hours except in special cases. As a result the men worked little overtime, outside of the extra gangs, and in consequence received little benefit from the increased hourly rate for the ninth and tenth hours.

Under the new rules the railroads may avail themselves of the advantage of the ten-hour day, especially

during the summer months, and thus obtain a greater output of work per man hour because of the smaller proportionate time occupied by the men in riding to and from work. The men also will benefit by this change, in so far as increased pay is concerned, since it will enable them to increase their incomes to the extent of their pay for the two additional hours worked per day. This applies alike to section men, bridge carpenters and other maintenance of way employees as well as the foremen, who, under the rules, are entitled to pro rata overtime for work with their gangs after eight hours.

The greater proportion of the men employed in section work live in small towns, where they spend but little time reaching the tool houses. As a consequence ten hours' work in a great many cases will keep them away from home little if any longer than the average workmen in larger cities who put in only eight hours at their work, but who are frequently required to spend two hours more on street cars going to and from their places of employ-

#### A Duty We Owe

For a long time men who claim to represent you and your sentiments have been engaged in a campaign of abuse and vilification to discredit the managements of the railroads, including the Illinois Central System, in the eyes of the public. You are in a position to develop the truth or falsity of their statements as far as our railroad is concerned. If you find that their charges are true, I suggest that it is your duty to bring the evidence to my attention and to the attention of the public. If you find that the charges are false, I insist that it is your duty as honest men to make public disavowal of the men who thus misrepresent you.

Our organization on the Illinois Central System is not perfect. I know of no human agency which is perfect. But I do have unbounded confidence in the honesty and integrity of the employees of our railroad. If there are any among us who by their acts are bringing us to discredit in the eyes of the public, it is our duty to get rid of them. We must stand before the public with clean hands.

The officers of the Illinois Central System are men who have been selected from the ranks of employees to hold positions of greater responsibility and trust, but they remain employees. Loyalty is a common duty we all owe to the company that furnishes us with employment. —From a statement to the employees of the Illinois Central by C. H. Markham, president.



ment. Railroad bridge and building gangs spend much of their time in camp cars away from home with little to occupy their attention in the spare hours. Therefore, it is believed that most of them will welcome the opportunity for the two hours' extra work.

A further modification in the new rules is the greater latitude allowed for local negotiations regarding such matters as the time of starting and stopping work, lunch periods, adjustment of reductions in force, etc. This is a definite recognition by the Labor Board that it is impossible to incorporate in one set of rules complete detailed working conditions applicable with full justice throughout the entire country.

#### 1921-1922

THE year 1921 will stand out in the memory of railway men as one of the most difficult in history. It was distinctly a year of reconstruction. The railways entered it in the midst of the most abrupt slump in traffic ever recorded. Their operating expenses were in excess of their revenues for the first two months. They were seriously in arrears in the payment of their bills owing to their inability to collect the amounts due them from the government. Under these conditions it was necessary for the roads to curtail their maintenance programs to the absolute minimum. Later in the spring when these conditions showed some signs of improvement and when work should have been started actively it was held back to secure the advantage of the reductions in wages then petitioned. By the time the decision granting these reductions became effective on July 1, traffic had begun to pick up, the earnings of the roads were increasing and they undertook maintenance work more actively. It is doubtful, however, if the roads as a whole did any more than make good the current wear and tear of last season, to the exclusion of attention to the deferred maintenance of the war years, although there are some marked exceptions to this statement.

The most favorable influence of the year was the increased interest and efficiency shown by the men in the ranks, prompted largely by the prevailing surplus of labor. This contributed to a marked increase in output per man and with some reductions in the costs of materials, served to lower the unit cost of work. A comparison of expenditures for the year just closed with those of the preceding year does not, therefore, afford a full measure of the work done in 1921.

Insofar as new improvements are concerned, relatively little work of any magnitude was undertaken last year. The season was so far advanced before the earnings of the roads had risen to a point which would warrant the lifting of the ban on expenditures that much of the work in contemplation was postponed until next season. The mileage of new lines completed was somewhat greater than that of the previous year, although with this exception it was the smallest for any year since the Civil War. Such mileage as was built was principally in the southern states, although 82 miles of line was completed on the government railway of Alaska and 46 miles in Wyoming. Almost half as much mileage of line was taken up as was laid, while the mileage on which operation was suspended but which was not taken up was approximately three times that of lines built.

The new year is now opening. What it will bring forth is problematical. The roads are entering it with earnings on a more satisfactory basis than a year ago, although they are still considerably below the rates specified in the Transportation Act. Labor is more efficient and with punitive overtime eliminated for the ninth and tenth hours, the way is open for a return to more nearly normal working conditions.

## Letters to the Editor

### IS THE PREMIUM SYSTEM FAIR?

Newton, Kan.

TO THE EDITOR:

I noticed in the October issue of the *Railway Maintenance Engineer* under the heading "Methods of Stimulating Friendly Rivalry Among Track Forces," one of the recommendations submitted at the Roadmasters' convention was the premium system. This committee, of course, was composed of roadmasters and supervisors, but I wonder if any effort was made to consult foremen on the roads where this premium system is in practice to find out how popular this method is with the men actually concerned.

I have handled sections on roads where this system was employed and have talked with other foremen on this subject and I have concluded that, if left to the vote of the foremen concerned, the system would be abolished. It is my opinion that the premium system does not promote or stimulate friendly rivalry among the track forces and I speak as one who has worked and talked with the men who were working under the system. Each foreman knows that there is no fair way of grading the sections and its foremen justly, and 95 per cent of the men know that they stand no show whatever of winning the premium, as locations and conditions are against them. Some of these men are as conscientious as if the section were their own property and are as good trackmen (and better), as a general rule, as the premium winner. As we all know, some sections are much easier maintained than others.

I believe that almost any foreman can maintain a prize winner, but it takes a good man to hold down the bad ones, and it is natural that a roadmaster or supervisor, if he is a good manager, will place the best men he can get on the worst sections on his division.

But you will say, all this will be considered. Impossible, the conditions on a division of 100 or 150 miles are too varied and too irregular to permit of a just decision. For example, what about the section that had extra gang help, the section that had new rail, that was resurfaced, retied and also reballasted? You will say, eliminate them. Good, but how long are you going to eliminate the man. One, two or five years? How are you going to grade the man and be fair to him and to the other foremen with whom he competes?

What makes track hard to hold? Speed, is it not? We know that there are some sections where the average speed is 50 miles per hour and others where it is 25 miles per hour. Also what of the difference in the condition of the rail? We all know that the heavier the rail the easier the track is maintained. There are some sections that it is impossible for a section gang to keep ditched, while others are very easily kept ditched. Take the factor of neatness. I have seen six miles of right-of-way that a section gang could never make presentable with its stumps, rocks, muddy cuts, etc., while others are so smooth that the grass can be cut from end to end by a machine. What about the labor supply? In some places the foreman can have the pick of the men, while in others he must take what he can get and hardly ever has his allotment filled.

No, the premium system as described does not promote friendly rivalry, as each man feels his handicap. It may pick the best section, but it will not pick the best foreman.

R. E. DONALDSON.

# Renewing a Bridge Without Falsework

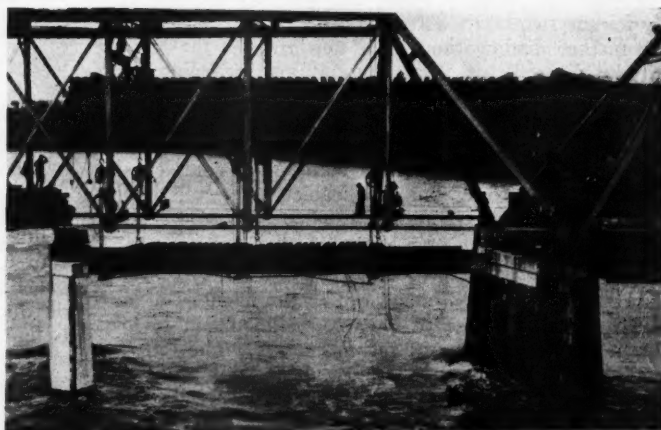
**Boston & Maine Develops Unique Methods to Overcome Erection Difficulties at Willimansett, Mass.**

By **A. B. CORTHELL**

Chief Engineer, Boston & Maine, Boston, Mass.

**T**HE BOSTON & MAINE has recently completed a new bridge across the Connecticut river, just south of Holyoke, Mass., to replace a structure built in 1883. The original bridge at this point was a single track structure built in 1845. In 1883 the masonry piers and abutments were extended and a new double-track, through, pin-connected Pratt truss bridge was erected. After about 37 years of service this has now been replaced with ten double-track deck girder spans by a method both unusual and effective. With one exception there was no delay to traffic.

The old structure had five spans, each approximately 149 ft. in length, supported on four stone masonry piers in the river and two stone abutments. By 1918 the old bridge had reached a point where it was becoming badly overstressed and after careful investigation and inspection



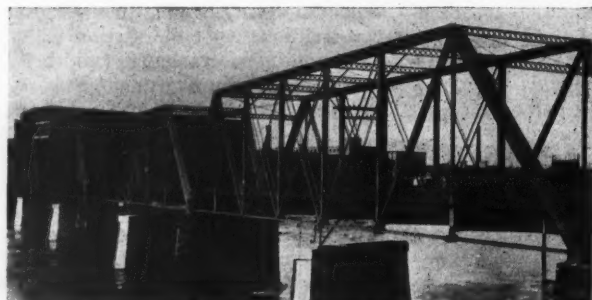
*Through Girders Suspended from Trusses While Old Floor Is Being Lowered to Clear.*

A contract for furnishing and erecting the steel work was made with the American Bridge Company in March, 1920, and a contract for the substructure with the Wilson & English Construction Company of New York in May, 1920. This latter contract covered not only the building of the five additional piers in the river, but also the cutting down of the old piers and abutments from 6 to 10 ft., which was all done under traffic, the steel being supported meanwhile.

## **Impracticability of Falsework Necessitates Unique Method**

Actual erection was started on April 17, 1921, and completed on May 22, 1921. The method itself was unusual and was carried out very satisfactorily, with almost no interference to traffic and without using falsework in the river. Falsework was impractical on account of sudden rises in the river and because of hard material in the bottom of the river unsuitable for piles.

A complete single track girder span, with the ties all in place, was first made up on flat cars and hauled out on the bridge by a locomotive. By the use of hoisting



**The Old Truss Spans With the New Piers in Position Half Way Between the Old Ones.**

instructions were issued restricting the speed on this bridge to ten miles per hour with only one track in service. At this time some minor repairs were made.

Studies for a new bridge showed that it would be cheaper to build five additional piers in the river and install 10 plate girder spans instead of rebuilding with 5 new through truss spans supported by the old piers, which would have to be rebuilt and enlarged to provide for the necessary track spacing and clearance. There was not sufficient clearance above high water for deck trusses. The estimated cost of rebuilding with trusses was approximately \$588,000, while the cost of building with additional piers and plate girders was estimated to be \$476,000.

The old bridge has a maximum capacity equivalent to Cooper's E-43 with 12 ft. track centers, while the new bridge has a capacity equivalent to Cooper's E-60 with 13 ft. track centers. It is situated just below the dam of the Holyoke Water Power Company, from whom it was first necessary to obtain permission to build the additional piers in the river, on account of a possible reduction in flow area in the river, with resultant loss of power to the power company. This permission was received early in 1919, but final authority was not received from the federal government until the date, March 20, 1920.



**The New Bridge Complete**

engines on the shore, the span was then picked up and suspended from the top of the old trusses by means of bridle beams, clamps and cables. As soon as this span had been suspended a second span was brought in and placed in a similar position alongside the first one, the

result being a double track girder span suspended from the old truss span. The next step was to burn out the old floor system below these girders with acetylene torches and lower the detached floor below the tops of



View of the New Girders From Above Just After Having Been Lowered Into Position

the new bridge seats, thus permitting the lowering of the new girders into final position.

The stringers in the old floor over the intermediate pier were burned off at the proper point and supported on blocking from the pier. The connection to the floor beam of that part of the stringer remaining in place was burned off and the stringer was supported by rods and straps which went over the top of the floor beam and



View Underneath the New Girders Before the Old Floor Was Removed.

under the bottom of the stringer. This was done to take up the deflection in the trusses under load.

As soon as this was done the tracks were connected up and the operation of trains resumed. This operation of putting in a new double track span occupied about three hours. This work was done mostly between trains on Sundays, although on two occasions it was done during week days. After the work had been fairly well started this operation was repeated, so that two complete double track spans of girders were installed during the working period on a Sunday.

Except for a delay of 30 min. to a local passenger train on the first Sunday, at which time there was a very heavy rainfall, there was practically no delay to traffic.

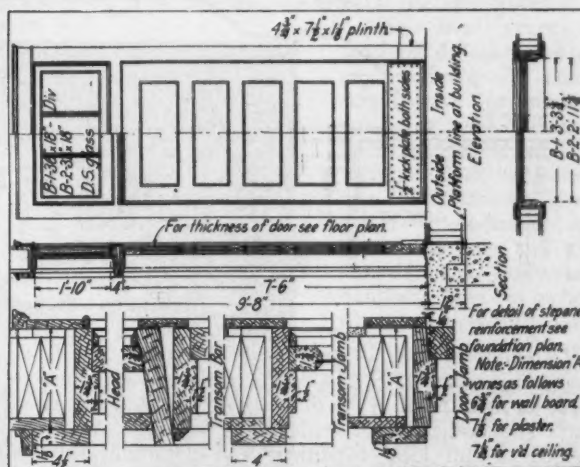
When the girders were installed for a complete truss span the trusses were picked up by two derrick cars, carried to the shore, burned apart and shipped away. All speed restrictions were removed from the bridge on June 14, 1921.

## Standardization of Building Details

By C. P. RAWSON

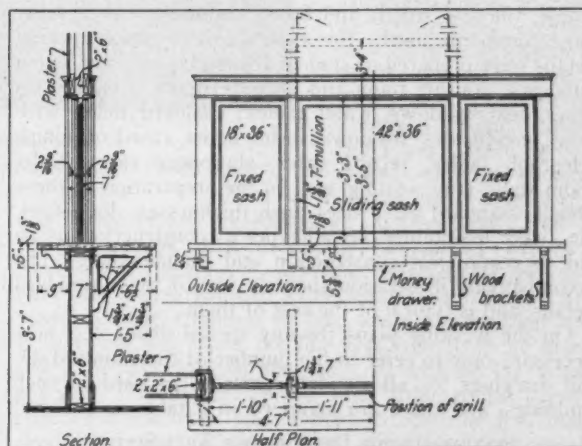
Architect, Chicago, Milwaukee & St. Paul, Chicago

EVER SINCE the railroads have been constructing buildings some method of standardization has been sought in order to prevent duplication of drawing room work, to simplify construction, and to cheapen maintenance. These efforts have usually resulted in the



Standard Details for a Door

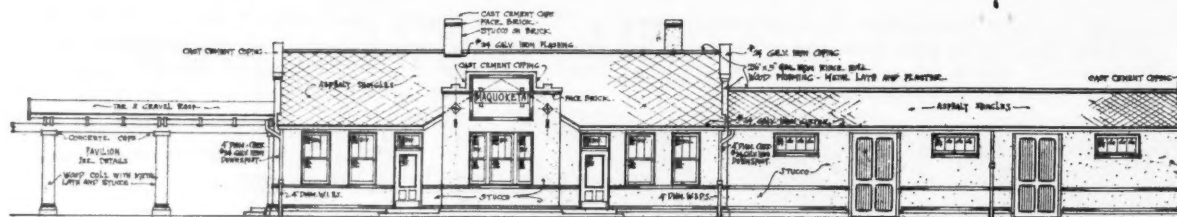
creation of standard working plans for various kinds or types of buildings. These have proved successful in most cases for small buildings, such as section dwellings, tool houses, small pump houses, flagmen's shanties, etc.;



Standard Details for the Ticket Window

but in the more pretentious structures, such as passenger depots, division offices, etc., these standard plans resulted in duplication of buildings not necessarily suitable to the particular site and locality, and creating a monotony in



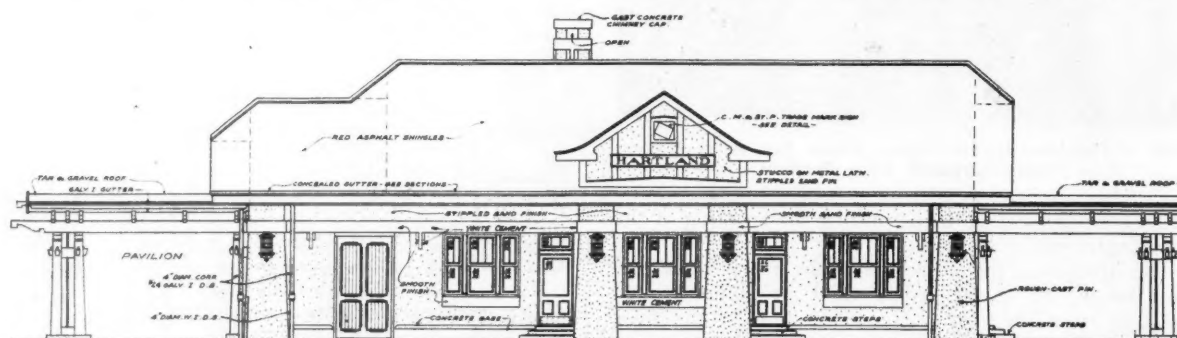


Passenger Station at Maquoketa, Iowa

structures to travelers along the line. In larger towns and cities these standard plans have been valueless, making necessary special plans for each location. This has resulted in a wide variety of unrelated styles.

These standard drawings now number more than 50, and are added to from time to time as may be necessary.

Elevations of stations at Maquoketa, Iowa, and Hartland, Wis., which are shown herewith, indicate how these



Passenger Station at Hartland, Wis.

To eliminate both of the above objections, the Chicago, Milwaukee & St. Paul several years ago adopted three or four fixed types of depots, etc., with all main parts standardized; but with the floor plans to be arranged to suit local conditions and requirements and with elevations designed to obtain a pleasing variety. This method has resulted in marked economy in the drafting room, the actual work on any special plan being reduced at least 50 per cent by the elimination of practically all detailing. At the same time maintenance of the buildings has been reduced owing to the standardization of glass, sizes, etc.

The principal types of construction decided upon were frame, tile and stucco and brick; the second being that most commonly used. For each of these types working details were prepared of standard single, double and triple windows; waiting room and baggage doors, freight windows, coal windows, water tables; standard ticket windows, conductors' windows, inside doors, cased openings, telegraph tables, record cases, stationery cases, toilet room stalls, trim, seating, etc. In the preparation of these details, standard glass sizes, sash thicknesses, door sizes, etc., were maintained for all types of construction, as an aid to economical construction and maintenance. The accompanying illustration shows a few of these standard details, and is typical of the rest of them.

On the working plans for any special depot it is now necessary only to refer to the number of the standard detail drawings for all standard parts to be used in such buildings, and these are arranged in a table as follows:

#### STANDARD DETAIL DRAWINGS FOR THIS STATION

B-1841 Single windows	B-1810 Triple ticket window
B-1847 Mullion windows	B-1813 Cased opening
B-1842 Triple windows	B-1815 Freight stationery case
B-1843 High windows	B-1816 Toilet partitions
B-1844 Coal windows	B-1817 Ticket window grille
B-1845 Outside doors	B-1819 Telegraph table
B-1814 Inside doors	B-1661 Mirror, frame and shelf.
B-1846 Baggage room doors	

details may be adapted to buildings of decidedly different architectural treatment and varying ground plan. These standards were developed under the direction of the writer, subject to the approval of C. F. Loweth, chief engineer of the Chicago, Milwaukee & St. Paul.

### Some Good Safety Habits for the Section Foreman\*

By J. C. WRIGHT

Section Foreman, Southern Pacific, Eunice, La.

**H**ABITS, like shadows, are always with us. We can't get away from them. They reflect every move. Still, we are unaware of their presence. Similarly, in everyday life we live by rule, yet we do not know it. No man in all the world could compile the code of rules which really govern our every activity. Why? Simply because these rules are so habitual with us that it is doubtful if they could be stated in so many words.

Personal safety is only one of the many phases of modern life. We want to be so completely governed by safe habits that compliance with safety rules will be second nature. All habits are acquired; they follow us without forethought.

At our last safety meeting, on one of the divisions it was reported that a section foreman while driving rail and using a car to transport the rail for driving purposes, mashed a laborer's foot. If he had used a push car, one man could have rolled the rail off, or if he had told his men to stand between the rails, this accident could have been avoided.

There are lots of these accidents happening every day. Why? Because we don't think. There are many minor accidents that we section foremen could avoid if we would watch our men and instruct them how to be careful. It is what we are not looking for that happens.

\*From the Southern Pacific Bulletin.

# What Are the Opportunities for the Maintenance of Way Man

Julius Kruttschnitt, Executive of the Southern Pacific and Former Roadmaster, Gives Some Essentials for Success

By WALTER S. LACHER

**“W**HEN MEN come to me for advancement, I often ask them, ‘Are you doing your work better than any one else in your class? I don’t think you are, because if you were, you couldn’t have *escaped* promotion.’”

Thus, in a few words, Julius Kruttschnitt, chief executive of the Southern Pacific System, summarized his attitude on the opportunities for advancement in railroad service. He carried the idea a step further by applying it to a particular case.

“If a roadmaster,” he added, “wants to be advanced to some higher position, he must be a better roadmaster than any of the others.”

Mr. Kruttschnitt appreciates the problems and trials of the roadmaster, because he once held this position himself. But men’s opinions are not always based solely on personal experience; the influence of others often plays an important part and it is safe to assume that this is the case here. Mr. Kruttschnitt himself has placed particular stress on his good fortune in serving under three of the greatest railroad men in American history, A. C. Hutchinson, Collis P. Huntington and E. H. Harriman. It was the latter who appointed him director of maintenance and operation of the Harriman lines, a position which gave him authority over maintenance of way and construction methods on more than 17,000 miles of road, in addition to his responsibility for transportation matters. To those young men who have become disheartened because irregularity of employment has often imposed a serious obstacle to the pursuit of aspirations in the railroad field, it should give renewed courage to know that Mr. Kruttschnitt’s ambitions were subjected to even greater trial, for he was denied the opportunity of railway employment for five years before he obtained his first position.

“I graduated from Washington and Lee University during the panic of 1873 when it was impossible to get into railroad work, but I had to ‘boil the pot,’ so when Colonel William Allen, our professor of engineering, asked me to take a place under him as teacher in the

MacDonogh School near Baltimore, of which he had been elected principal, I was glad to do it.”

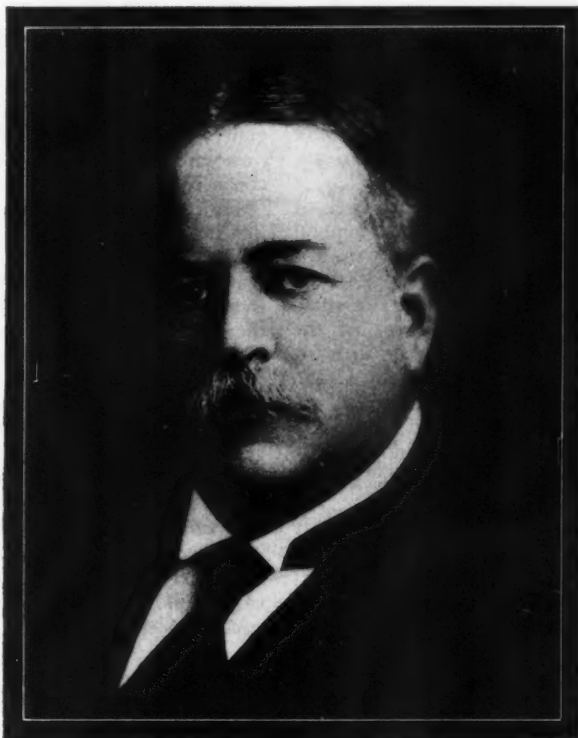
“But when you actually did get out and were placed in charge of some railroad construction in Louisiana in 1878, didn’t you find that you were seriously handicapped by the lack of an apprenticeship in actual work of the kind you were required to direct?” he was asked.

“My five years of teaching did not give me any training in actual construction or maintenance of way problems, but it taught me self-control and how to handle men. A construction engineer or roadmaster has to control men and also himself, and five years handling boys in school was good preparation for handling men. Many men are placed in positions of authority who do not know how to use it. You know, it is possible to refuse a man’s request and yet have him feel pleased. On the other hand, some men are incapable of granting a favor without adding an insult.”

Mr. Kruttschnitt’s first railway position was that of construction engineer on a 64-mile extension of the Morgan’s Louisiana & Texas, now a part of the Southern Pacific, Louisiana Lines. Here he contended with the personal discomforts, long hours

and never ending responsibility that generally fall to the lot of the man in charge of railway extension work. Mr. Hutchinson, who was president of the road, gave him a free hand to work out his own destiny and paid but little attention to him while construction was in progress, but when the line was completed he manifested his approval of the work by making the young engineer roadmaster of the line, although his knowledge of track work was limited to what he had managed to learn in connection with his construction work.

Mr. Kruttschnitt believes that a road should develop its own officers and not hire “ready-made” men from other lines. This has followed as a consequence of an experience that befell him during his service as a roadmaster. Upon hearing that a general roadmaster was to be appointed, he inquired as to his chance of advance-



Julius Kruttschnitt  
Chairman of Executive Committee, Southern Pacific System.

ment and was told that a man from some other road was to be hired for this position, thus effectively cutting off any immediate opportunity for promotion. Fortunately, this plan failed of execution, and instead Mr. Hutchinson advanced him to this new position in 1882. But the discouragement which he had previously suffered made an impression on him, which is now reflected in Southern Pacific policies.

His authority was not long restricted to maintenance of way, for a year after he became general roadmaster he was made chief engineer and superintendent of the whole road. In 1885 when the Morgan's Louisiana & Texas was leased by the Southern Pacific, Mr. Hutchinson was made general manager of the Atlantic System of the Southern Pacific (Lines East of El Paso), and he, in turn, made Mr. Kruttschnitt assistant general manager. In July, 1889, when Mr. Hutchinson retired, Mr. Kruttschnitt succeeded him, thus becoming a general manager at the age of 35 after only 11 years' experience in railway work. There is no small degree of interest in the fact that ever since that date, over 30 years, he has been a general officer. These years have witnessed the greatest progress in the southwest and on the Pacific Coast, during which the Southern Pacific has been developed into a powerful transportation system extending from Portland, Ore., to New Orleans, La. Here surely were opportunities for men who had the discernment to appreciate and the ambition to pursue them.

Six years after his promotion to general manager of the Atlantic System, Mr. Kruttschnitt became general manager of the entire Southern Pacific, and when Mr. Harriman was made president of the road in 1901 he made Mr. Kruttschnitt assistant to the president, in which capacity he was virtually the executive officer of the property until April, 1904, when he was made director of maintenance and operation of the combined Union and Southern Pacific systems, commonly known as the Harriman lines. This position he occupied until, following the dismemberment of this system in 1913, he became chairman of the executive committee of the Southern Pacific System.

Many men whose training has been obtained primarily in maintenance of way have demonstrated an ability to assume responsibilities beyond the scope of their earlier experiences. Others are not so successful and this contrast in results raises a pertinent question in the minds of many railway men. This was put to Mr. Kruttschnitt as follows:

"Do you think that a man should endeavor to obtain a direct contact with as many branches of railway service as possible?"

"That was the thought behind the student course plan introduced some years ago on the Southern Pacific," he replied. "This was designed primarily for college men, but was by no means restricted to them. One difficulty with a course of this kind is that some men become restive and feel that they do not advance fast enough. It is unfortunate that men seem inclined to look for good jobs rather than an opportunity to show what they are worth.

"To be of maximum value to his employers a man must be able to get along with his associates, to co-ordinate his work with that of others. One advantage that comes from giving the men direct experience in the work of each department is derived from a greater degree of harmony between the officers of the various branches of the service. Mr. Harriman was particularly insistent on harmony among the members of his staff and refused to be drawn into any controversies that arose between the department heads. He required them to settle their own differences without bringing them to his attention.

"A man must appreciate the relation of his work to the real object of operating a railroad, namely, to give good service and to obtain a profit. The efforts of the maintenance of way officer are too often directed to the securing of the largest possible appropriation for his work so that he may raise the standard of the track on his division to the highest possible grade, without adequate thought of the relation this expenditure should bear to the traffic and earnings of the line. Instead of pursuing this policy, he should co-operate with the transportation officers in determining the character of track that can be maintained adequately for the least expenditure under the volume of traffic handled. Or, to put this in another way—in moving traffic on a satisfactory basis, the first requisite is good track. Next is proper equipment to run over the track, and third is a body of competent men working in perfect harmony to use the track and equipment at hand in handling the traffic at the least cost.

"On the Southern Pacific the division superintendent is the general manager of the division. In other words, having selected the man for the position, the management gives him a free hand to work out his own problems. This same policy was carried out by Mr. Harriman in the management of the lines under his control. Each general manager was free to carry out according to his own ideas the general plans and policies established in conference."

However, the chief executive of the Southern Pacific has no sympathy for the man who talks about "larger policies" to the depreciation of details. In his opinion, no man is a competent executive who has not acquired a thorough knowledge of details by actual contact with them. Without it he cannot safely judge of their execution by others.

"To summarize," said Mr. Kruttschnitt, "a man must know the details of his work thoroughly, but that is not enough. He must be industrious. There is, of course, a great difference in the natural capabilities of men. Most of the world's work is done by men of limited natural attainments; but a man of limited natural attainments also has considerable opportunity because other men who may have greater native ability are often inclined to be slothful, so if he makes up his mind to do his best he may easily outdistance the man who has not been fired with equal ambition."

### Spike Heads and Claw Bars

SOME of the most trifling things are the greatest annoyance. These little affairs are often the hardest knots to untangle. The best of engineering skill has been brought into the design of a spike head so that it might have the best form for driving, holding, pulling, and still be free from objectionable features from other causes.

Then the claw bar for pulling—the shape of the claw is a problem by itself. After finally having a spike head and claw which fit perfectly, all the difficulties of spike pulling are not over. There may be grease on the head, or the spike may be stubborn and the head snap off, or it may come clear out with a jump, any of which will allow the bar to go crashing down unless the man is master of the bar.

We perhaps have more injuries from this cause when pulling inside spikes than any other common to trackmen. Lately there have been many of them. The bar has gone down on the opposite rail with human fingers as buffers. Men, look out for it. Foremen, explain to your men the danger and then show them how to avoid it.—*From the Safety Message, D. & R. G. W.*



# Casey Comes to the Rescue

"I'm Glad He Appreciates Us \* \* \* But Man  
I Wouldn't Have Missed  
That Fight"

By CHARLES H. SMITH

CASEY JONES, maintainer of block signals, was dreaming the dreams of the just. He was, in fact, enjoying a motor trip to his favorite lake for black bass. The car he was driving was by some unexplained miracle the new Roamer he had wanted so long and the motor purred sweetly as he sped over the road.

Suddenly he saw a railroad track ahead which he must cross. At the same instant he noticed that a train was coming. Clouds of smoke and steam billowed over the hill to his left. A second later Casey realized that he could never make the crossing ahead of the train. Releasing the clutch, he shut off the gas and threw his weight against the brake. The terrific speed of the car caused the rear wheels to skid. The crossing bell just ahead rang loudly and with incredible speed, warning him to stop. But Casey couldn't stop. The rear wheels were sliding over the gravel, hardly checking the momentum of the car! He had applied the brake too late. He drew nearer the track! The train was coming close—would the car never stop skidding? The crossing bell rang louder and more insistently. The car shot on the track directly in front of the engine pilot and then—Casey woke up.

For a few seconds he blinked sleepily. But something still bothered him. He couldn't quite separate his dreams from reality. That crossing bell was still ringing shrilly. Where was he, anyway? Ah, yes. Now he knew. The bell ringing so insistently was the telephone in the living room of his own home. Jumping from bed, he snapped on a light, stepped into his slippers and wrapped a bath robe around his pajama-clad figure. Then he walked into the living room and took down the receiver.

"Hello!" he called, in a tone that was remarkable for its lack of cordiality.

"That you, Casey?" came a voice over the wire which he recognized as the towerman's at the diamond in the yard.

"Yes, it's me! What in hell do you want waking me up at this time of night?"

"Got a little wire here from J. W. C.," explained the towerman laconically. "An eastbound drag reports 42 red. They want you to fix it up."

"The devil they do! I never knew it to fail! If a man wants to get in a good night's sleep, something *always* happens to get him out! Here I just get to bed and to sleep and this damn telephone wakes me up! And it's the very same way every time a man wants to get in a good night's rest!"

After delivering himself thusly and thereby slightly relieving his feelings, Casey set about dressing with as much alacrity as he could command. His dressing accomplished, he snapped off the light and, leaving the house, started down the dimly lighted street.

Signal 42 was not very far west from Casey's car house. He unlocked the door, lighted a lantern, and placing his tool bag on the tray of his motor car, ran it out and placed it on the westbound main. A shove of the car and he was off. Reaching No. 42, Casey glanced



*A Shove of the Car and He Was Off*

at the signal. It was red, all right. He opened the relay box and, lifting his lantern, inspected the relays. They were open. Closing the box, he snapped the lock and after a brief inspection of the bootlegs took his voltmeter from his tool bag and started eastward down the track section. His car, which he had placed on the eastbound main, he shoved ahead of him as he walked back in the direction from which he had just come. About every five rail lengths he stopped and took a reading, but as he was working towards his battery he got no indication when he placed the line across the track.

Casey continued testing with his voltmeter until finally when he reached a point near the center of the track section and placed the connections on the rails the hand on the dial shot over. "I'm close to it now," he muttered. He retraced his steps a rail length and again tried the voltmeter. Again he got a reading. He walked back another rail length and put the line across once more. This time the hand remained stationary. Picking up his instrument, Casey wound the wires around it and began to inspect the bonds carefully. In a minute he found the trouble—a rail broken almost squarely across near its center. "Ah-ha!" he exclaimed as he held his lantern close to the break for a more minute inspection. "A little job for Goddard!"

For a minute he regarded the broken rail thoughtfully. It had pulled apart perhaps half an inch and the last train passing over it had worked the ends up and down until the spikes had been pulled. Casey reached into his overalls pocket and drew forth two torpedoes. Placing his voltmeter in his tool bag, he jumped on his car and continued eastward a quarter of a mile, where he placed the "guns" on the rails. "Guess that'll hold 'em till I get hold of Goddard and his men—if they should happen to use the wrong main," he said to himself as he pressed the leaden strips around the rail. "I can flag 'em myself if any come from the west."

Then, turning his car around, he moved it over to the westbound main and started for the diamond. Arriving here, he pulled the car to the set-off, mounted the stairs to the tower and notified the dispatcher of the condition of the track. This done, he lighted a cigarette and seated himself near the stove while the towerman first transmitted Casey's message to the dispatcher and then on his instructions called Foreman Goddard on the phone.

\* \* \* \* \*

Foreman Goddard and three of his men arrived at their car house 40 minutes after receiving the towerman's message. They lighted lanterns, rolled the motor car out on the westbound main and prepared to leave. While God-

dard locked the car house door Harry Friend, one of his men, primed the carburetor. Joe Densmore and Bill Holly, the other two men, made ready to shove the car forward.

"We'll go down and take a look at that rail," said Goddard as he seated himself on the front end of the car, "and if we can drill it and put a pair of angle bars on we'll do that and not change it out until tomorrow morning. I don't like the idea of 'larrying' a rail and changing it out at night unless it's absolutely necessary. We can do it better and quicker in daylight when we have all the men with us. Did you put the drill on the car, Joe?"

"You bet I did!" replied Joe.

The pushers gave the car a shove and a minute later the car moved off under its own power. Jumping on, the two pushers seated themselves and watched behind. A few minutes later Goddard caught sight of a lantern ahead and, drawing nearer, the trackmen found Casey waiting for them beside the broken rail.

"Good evening, men," he greeted, smiling good-naturedly. "I've a little job for you."

"So that's it," said Goddard, holding his lantern close to the fracture as he caught sight of it.

"Yep. An eastbound drag found 42 red and reported it. They got me out, and I thought I'd like a little company. So here we are."

"Good!" replied the foreman. "We'll bolt on angle bars, redrive the spikes, and it will be O. K. until we change it out. Harry, you go back east and flag."

"I'll flag west for you," volunteered Casey. "That'll leave you two men to do the job."

"All right, Casey. Do that, and we'll have the job finished inside half an hour."

Casey started west, while Harry Friend picked up his red lantern, torpedoes and a fusee and went eastward. Goddard and the remaining two men began taking the tools from the car preparatory to repairing the rail.

Within the prescribed 30 minutes the section men had the holes drilled and the angle bars placed and bolted. One man finished tightening the nuts and driving the spikes, while Goddard directed the other to notify the maintainer that the rail was ready for bonding. Casey soon returned with the man and prepared to bond the improvised joint. The trackmen placed their motor car back on the rails and made ready to return to the car house, picking up Harry Friend on the way back.

"Watch out for those guns I put on the rail," warned Casey as the car started. "If you don't hit 'em, take 'em up."

The car moved along slowly for perhaps a quarter of a mile, the foreman and Joe Densmore keeping watch for the flagman. "I can't see a thing of his lantern," remarked Goddard as he gazed ahead, trying to discern the red glow of Friend's signal. "And Casey's guns ought to be just about in here, too." He stopped the car and Joe jumped off and, running his foot along the rails, located and removed the torpedoes.

"We'll keep on and see if we can find him. Maybe he's flagging 'way back," announced the foreman.

The car continued ahead, the men watching for Harry Friend's lantern. But finally the dark outlines of the car loomed up a few rods ahead and still no sign of the flagman!

"I can't make it out," commented the foreman. "Harry isn't the man to go wrong on his job. He's dependable and I can't believe that he would go off and leave the track unprotected. We must have missed him somehow. Let's put the car on the westbound main and run back. He must be around somewhere."

They rolled the car over to the westbound main and started back towards the place they had just quitted.

The car ran slowly and they watched sharply for some sign of the missing flagman. But again they reached the rail they had recently repaired without seeing anyone. Casey had just finished drilling one side of the joint and was about to put the drill over on the other side.

"Hello!" he called in surprise when he recognized the trackmen. "Now what's the matter?"

"We can't find Harry," explained Goddard. "We watched for him all the way back to the car house and didn't see anything of him at all, so we came back thinking maybe we'd missed him."

"That's damn peculiar, I'd say," remarked Casey after a minute's thought. "Maybe someone's tunked him on the head for his roll."

"We'll go back to about the place he must have been flagging, take the car off the track and look for him," announced Goddard to his men.

They ran the car to the nearest set-off and started down the track.

"I'll be along and help you hunt for him," called Casey, just as soon as I finish this job."

"Guess we'd better separate and look around among the cars," directed Goddard. "We can cover more ground that way. Call if you find him."

The three trackmen took separate paths, Bill Holly and Goddard taking the two lanterns. Joe Densmore, without a light, was forced to go more cautiously. He had not proceeded far when his ears caught a strange sound. The sound seemed to come from the car just ahead of him, as if someone were moving heavy objects around inside of the car. As he listened his ears caught another sound—the sound of something just ahead of him; something that seemed to be laboriously moving towards him. The slight crunching of cinders drew nearer. The whole thing was uncanny. Joe's hair began to rise under his hat and his impulse was to run for help as fast as his legs would carry him. Then the thought came to him that maybe—maybe the crunching of the cinders was due to the writhing of his fellow-worker's body on the ground. For a few seconds he stood indecisive. The noise of the objects being moved in the nearby car had stopped. The only way to ascertain what was making the noise in the cinders was to strike a match. Joe felt in his pocket and found one. He quickly struck it on his trousers leg. It flared into a blaze, dimly lighting a little space in front of him. At first he could see nothing, but after a bit he made out the dim outlines of a rope-bound figure lying on the ground just ahead of him. Bending down he held the match close to the man's face. In a second he recognized Harry Friend, securely bound with manila rope. A gag prevented him from calling for help, although he was conscious. Joe tore the cloth from Harry's mouth.

"What's up, Harry?" he asked excitedly. "What has happened?"

"Untie me quick, Joe! Hurry before any of those fellows in that car come! They might a seen your match," replied his fellow-worker, speaking rapidly, but in a low tone. Joe quickly untied the knots and in a few minutes Harry Friend scrambled to his feet, freed. "Listen, Joe," he said. "There's a bunch of car thieves working in that head car there. They're carrying the stuff away—a whole gang of them. I heard them when I was flagging. I went to investigate the noise and they knocked me down and tied me up. There's another guy over on the other side of the track, I guess. I heard someone rolling around in the cinders. Let's see who it is. Careful about making any noise, Joe."

The two cautiously walked over to where Harry had heard the noise. And they discovered he was right in his surmise. A man lay helplessly bound on the ground be-



tween the tracks. The trackmen didn't know who he was, but the fact that he was bound and gagged seemed to establish that he did not belong with the car thieves' gang. Harry removed the gag from the man's mouth.

"Get these ropes off, quick, Pard! You're a section man, aren't you?"

"Yes," answered Harry. "We have been repairing a broken rail. I was flagging when some car thieves got me."

"I saw them get you," quickly answered the man. "I work for the company, too—police department. I was guarding that car of whiskey there when they surprised me and knocked me with a billy. If you men will help me we'll nail the gang of 'em. They're taking cases of bottled whiskey from that head car there and loading 'em on a motor truck. They've been at it for half an hour and they must be about ready to beat it. We can surprise them."

"There are two section men in the yard somewhere hunting for Harry here," said Joe, as he pulled the ropes from the detective. "Hadden't we better get them first?"

"Can't take the time," replied the detective. "They're liable to beat it any minute now. The three of us can nab them. Come on."

He led the way towards the edge of the yard, Harry and Joe following closely after him. Just outside the last siding they saw the outlines of a truck piled high with cases of whiskey. Apparently no one was near it. The trio crouched between two box cars and waited for the robbers to return. In the distance sounded the put-put of a motor car coming.

"There comes Casey," whispered Joe. "He's the maintainer," he added for the detective's benefit. "He'll be looking for you, too, Harry."

The car slowed up and stopped. A minute later four figures carrying cases of whiskey emerged from between the cars just ahead of where the three railroad men were concealed. "Get ready, men," warned the detective. "I'm going after 'em."

He stepped out quickly and confronted the nearest robber. "You're under arrest!" he said incisively. "Drop that whiskey and put 'em up!"

Instantly the four thieves let go of their burdens, but instead of "putting them up" they rushed towards the detective. He was ready. The foremost man received his right, staggering him and checking his attack. But the remaining three sprang on the detective and bore him down. Harry and Joe now joined in the melee with right good will and slugged the three assailants who had overpowered the detective with such good effect that they were forced to abandon the fight with him and turn their attention to the trackmen. While three of the gang engaged Joe and Harry the fourth broke away and ran for the truck. He jumped to the driver's seat and stepped on the starter. The engine started with a roar. Clearly the thieves intended to make a quick getaway. The driver threw in the clutch and the heavily laden truck started forward. Feigning an attack the three confronting Joe, Harry and detective rushed towards them and then quickly retreated towards the truck. The truck gathered motion. The trio turned and ran towards it. Were they going to escape scot free? Harry and Joe started after them. The detective still lay on the ground partly stunned. "Stand back or I'll shoot!" yelled one of the gang, turning on the trackmen. The three ran for the truck. At this critical moment a figure flashed towards the departing load of whiskey. A leap and it was on the running board. Something rattled and one side of the hood went up. A long arm shot under the lifted hood, gathered a bundle of wires together and with a quick, powerful sweep ripped them loose. Instantly

the motor stopped. Casey—for it was he—swung himself around so that he faced the driver and prepared to give battle. "Come on, men!" he shouted with enthusiasm. "Come on! Let's give 'em hell!" Casey, it was quite plain, was not adverse to a fight.

The three gangsters, who had clambered to the top of the pile of cases on the truck, leaped to the ground. Joe Densmore engaged the first one and Harry Friend took on the second. It was a slugging match pure and simple, but what the trackmen lacked in science they made up for in willingness. The third thief danced about attempting to get in a blow first at Harry and then at Joe. A second later and a figure shot from the driver's seat on the truck and landed in a heap on the ground followed by the triumphant Casey.

"Give 'em hell, men! I'm coming to help you!" he shouted. With a few quick blows he disposed of the unengaged thief and turned his attention to assisting Joe. And then two more figures came running towards the combatants—Foreman Goddard and Holly.

"What's the matter here?" yelled the foreman excitedly, unable to see what was going on, but hearing much. "What's the matter?"

In the midst of sparring Casey was not too busy to answer him. "We're spanking a bunch of roughnecks, Goddard. Come on! Get in the game!"

With two of their comrades disabled and outnumbered three to one the end came suddenly. "Let up! I give in!" yelled the man who was attempting to ward off the combined attack of Casey and Joe. The other man put his hands up as soon as he could do so without exposing himself to the blows of Harry, who was pressing him hotly. "I quit!" he shouted.

Casey, the detective and the trackmen rounded the four car thieves together and then took inventory of the casualties. The detective had a very sore head where one of the gang had struck him with a billy. The trackmen were all somewhat bruised with the exception of Goddard and Holly, who arrived too late to get into the fray to any great extent. Casey declared he hadn't got a scratch.

"That was certainly one damn good fight, men!" he declared gleefully. "I don't know when I've enjoyed anything more than I have this little mix up."

"It had a few unpleasant features, though," qualified the detective, feeling the swelling on the top of his head. "Will you men guard this bunch while I call the wagon?"

"Easy we will!" replied Casey.

\* \* \* \* \*

A week later Casey, Goddard and each of the three trackmen received a personal letter from Superintendent J. W. Cornwall. Foreman Goddard's read as follows:

"My attention has been called to the action of yourself, Mr. C. Jones, maintainer, and three of your men, Mr. Harry Friend, Mr. Joseph Densmore and Mr. Wm. Holly, on discovering a gang of car thieves engaged in robbing C. G. R. & W. 19874 loaded with cases of whiskey on the night of October 10th. When you men discovered this car was being robbed you released Mr. Larry St. John of the police department and then assisted him in engaging the robbers, capturing them and a truck which they had loaded with cases of whiskey taken from the above car.

"In view of this action by you gentlemen, resulting as it did in the capture of the four robbers and the saving of a number of hundreds of dollars' worth of freight from being stolen, I wish to commend each of you for the prompt and effective action you took in safeguarding the company's interests.

"With a trackage of over 4,000 miles the company is dependent, to a great extent, on the vigilance of its employees for the protection of the company's own property as well as that which is entrusted to it for transportation. Because of the fact that you men are constantly patrolling the tracks while engaged in your daily duties you are in an exceptionally good position to protect the company's interests. Your action on



the night of October 10 shows me that you are doing this very well indeed.

"I am very glad to commend all of you and to express my appreciation of your actions in behalf of the company's welfare.

"Cordially yours,

"J. W. CORNWALL, Supt."

cc. "The C. G. R. & W. Magazine."

cc. "Employment Bureau."

Foreman Goddard read the letter slowly, carefully folded it, and placed it in his pocket. That afternoon he met Casey.

"Get a letter from J. W. C. about the other night?" he asked.

"Yes," replied Casey. "Did you?"

The foreman nodded assent. "What do you think about it?" he countered.

"Well," replied Casey, thoughtfully, "I'm glad he appreciates us saving all that liquor, but, man"—and here Casey grew confidential—"man, I wouldn't have missed that fight for a month's pay!"

## The Value of Planning Work Systematically

BY W. F. RENCH

IN THE COURSE of a comprehensive inspection of many individual sections it is probable that one section will be found which in degree of maintenance is far below the average of the others. Such a section was discovered by the writer where it would least have been expected. The condition of the section at the moment was such that two neighboring section forces and a floating gang had been assigned to render assistance in an effort to overcome the defective maintenance before the close of the working season. It was apparent upon the most casual inspection that the deterioration had progressed even to the extent where the element of safety was involved. At one point in a high speed main track it was necessary to renew the cross ties out of face through two entire panels of track. The foreman of one of the assisting section gangs, inspired, no doubt, by some resentment over his being taken from his own track, asked the writer this question: Given a number of foremen having equal opportunities for the maintenance of their sections, why should one of them require assistance from the others? The answer returned was that the personal element almost always determines the matter. An analysis of the basic causes resulting in defective maintenance should lead to the discovery of how such a result may be avoided.

At first thought it might be alleged that the proximate cause is lack of supervision. Such a condition, however, may develop in spite of the most careful attention on the part of the supervisor. He will recognize the retrogression, while for the moment powerless to apply the remedy. Further, the temptation is strong to afford the foreman every possible opportunity to work out his problem without any outside assistance. In most cases this forbearance, coupled with a measure of counsel and co-operation from the supervisor, will in turn effect the desired object; in others, the section will continue to go backward, as was the case in the example cited. Inquiry developed that the cause in this instance was not inattention or neglect. When such is the case the solution of the problem is apparent. It was due rather to failure of the foreman to select, organize and put through the proper repair at the proper time; or, in other words, his work was not systematized. The lesson to be drawn from this man's failure is the value of a definite program, the knowledge of what to do first and what to do next.

The foreman's work is not merely a discharge of routine duties. Maintenance officers recognize that the job requires the closest attention to the sequence of operations. While many supervisors do plan the detailed work of their section forces, among many others, by reason of the demands of side duties, this outlining of work for the sections is not practicable. The foreman then has an opportunity which many of them prize highly of developing their own program of work, to be censored, of course, by the supervisor, but which in nine cases out of ten he will cheerfully approve. When the working season is nearing its close the care with which the successive items of work have been selected will be reflected in the results obtained. At the very least it will be shown that a general scheme of repair has been carried through and what has been left undone will not rise up to become a plague upon what has been done.

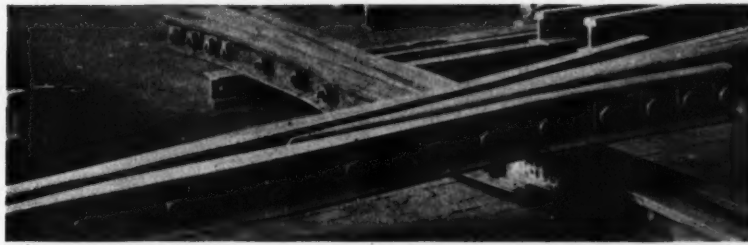
The true gage of a foreman's worth is his ability to choose day by day the work most necessary to be done. No matter how efficiently a piece of work may be performed, if it is not the right work to be done at the time it is effort misdirected. It is a well recognized principle that there is no perfect track. The best track on the best railroad probably does not deserve a mark higher than 9 when 10 is used to denote a perfect condition. The efficient foreman is the one who can differentiate between the repairs needed for sufficient maintenance and those which would fall in the category of "galvanizing." Since there is no expectation of attaining perfection, the foreman should plan his work with the object of maintaining a uniformly good character of track throughout the entire length of his section, rather than striving for a higher grade of track over only a portion of his section.

I would designate uniformity as the cardinal requirement of track maintenance. This feature more than any other distinguishes the maintenance of a road I have in mind. The line of the track is not perfect, although due attention is given this item of the repair. Slight defects of the surface occur here and there. The rail and ties would be classed as good rather than first class. The policing is neat without being extravagant. Thus, while a regular border for the stone ballast is preserved, little of it has been laid by hand. The feeling one is bound to find growing upon him as he walks over the track is that here is a good railroad. This impression is not disturbed by the occurrence of an inferior piece of track whose needed repair has had to be deferred to another season. The good opinion which has been formed is only confirmed from the impression gotten in riding over the track on trains.

The foreman, then, who would fall into the class of efficient maintainers, must give his best thought to the general problem of his section work. He must keep always in mind that "he has charge of the repairs on his section and is responsible for the safety of the track." This duty can only be fully met if he knows day by day the requirements of his section. When he has a concrete schedule for the application of the necessary ties for the year's renewals he can note the progress being made and if necessary suspend some non-essential work to attain the larger end. This planning is what I would call "organization," the placing of the several items of work in proper relation one with the other. The ability to organize work is an indispensable quality of the successful foreman and one which distinguishes him from merely the expert track man. It is the keynote of his whole performance in getting results. While the quality is largely inherent, it may be augmented by experience, by reading and study, and by faithful adherence to the instructions given him from time to time.

# Philadelphia & Reading Reclaims Frogs by Unique Methods

Both Plain and  
Hard Center  
Equipment  
Is Repaired



System Is At-  
tended With  
Very Satis-  
factory Results

*Two Badly Worn Frogs After Being Reclaimed*

**T**HE Philadelphia & Reading has been reclaiming both hard center and carbon steel rail frogs by two methods, one for each type of frog, which raise the worn centers and points to the correct height by mechanical means. In the case of the rail-bound hard center frogs, the running surfaces are brought to the required plane by giving the frog three bends or sets under a press and then grinding to a finished surface. The points of the rail frogs are raised by expanding the web of the rail over a small area near the actual point of frog. The results obtained have been very satisfactory, the service rendered by the reclaimed frogs being comparable to that of new ones.

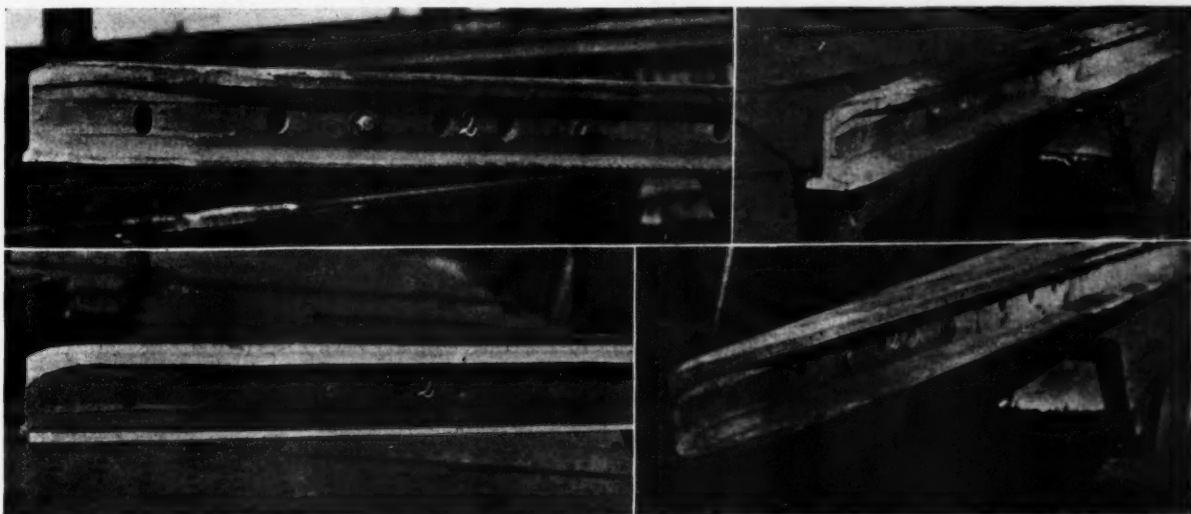
This work is performed in the railroad's frog and switch shop at Reading, Pa., where maintenance materials, such as rails, frogs, switch stands, switch points and other pieces of equipment, etc., are forwarded for inspection before being scrapped. Old rail is cut into switch points and wing rails, while old switch points are also utilized for wing rails and frog points on the standard frogs.

All material sent in to the shop is carefully inspected and sorted into two classes, i. e., that which can be reclaimed and that which should be scrapped. A part of the rail worth reclaiming for frog and switch work is cut into the lengths required for different sizes of frogs and bent to the approximate shape and the base trimmed.

The partially completed wing rails are then stored according to the frog numbers and to the weights of rail for which they correspond.

## **A Regular Procedure Is Used for Reclaiming Frogs**

In repairing the carbon steel rail frogs, a regular procedure is used in every case, the parts which are usable being reassembled without interchange with those of other frogs of the same number and weight. When a frog is brought into the shops it is looked over carefully to determine what part or parts need to be renewed and also how much the point must be raised in order to bring it back to its correct height in relation to the rest of the frog. It is next taken apart and where the old wing rails are badly worn they are scrapped. New wing rails, i. e., those made from reclaimed rail, are placed in position, one at a time, after which the bolts are placed in the holes running through the point and the filler blocks. The assembly, consisting of wing rail, filler blocks and center piece or point, is then clamped together and the location of the filler blocks, the correct points of bend and the necessary amounts, etc., marked on the wing rail. The clamps are withdrawn and the wing rail turned over so as to rest on the head of the rail and one edge of the base. The filler blocks are laid in the proper positions, using the marks to insure accuracy, and with the holes as a guide the web of the wing rail is center-punched for



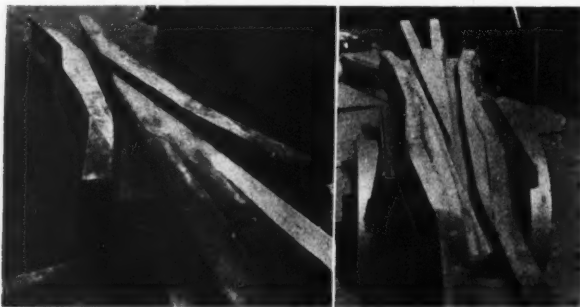
**Typical Views of Carbon Steel Rail Points During Reclaiming Process. Upper Views Show Points After Having Been Raised to Proper Height, Lower Views, the Same Points After Planing and Dressing**

drilling. This procedure is then repeated for the opposite wing rail, after which all parts are given a number which is painted on, using an easily distinguishable color.

#### The Point Is Raised by Expanding the Web

The point for a length of about 15 in. to 18 in. is next heated in an oil furnace to a dull red, after which it is removed and the point raised to the required height by expanding the web over a small area measuring approximately  $1\frac{1}{2}$  in. in height and 9 in. long. In doing this work the heated point is placed in a built-up steel form, supported on the base of a steam hammer. This form has a steel block with an upper surface area corresponding to the size of the depression mentioned. A block of similar surface area is placed on the other or upper side of the point after it has been placed under the hammer. The upper steel block is then given one or more blows, according to the amount which it is necessary to raise the point. By utilizing these blocks and the form, the thickness of the web is kept unchanged near the head of the rail and the base and the extreme point, and it is thus unnecessary to shim between the point and the filler blocks when reassembling, as the same surfaces are in contact as before.

After cooling, the point is placed in a planer where the rough edges are removed and the head and base dressed to a correct line and section. Where necessary,



A Reclaimed Hard Center Frog. Lighter Portions Show Where Metal Has Been Ground Off

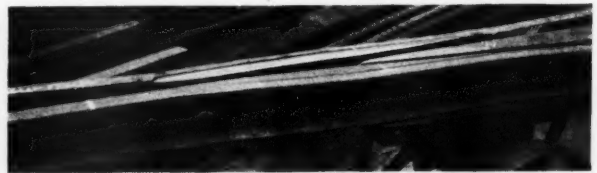
A Reclaimed Frog in Which the Flangeways Have Been Deepened

the two sections of the point are riveted, after which the frog is completely assembled, using the parts belonging to it as identified by the painted numbers. It is then stored or shipped, according to the needs of the road.

#### Different Method Is Used for Hard Center Frogs

In repairing hard center frogs, where it is necessary to replace the wing rails, in addition to raising the point and the worn center, the replacements are made first, after which it is bolted up complete. It is then transferred to a hydraulic press, where it is turned over with the running surfaces down and resting on two supports, the vertical center line of the press being brought over a point approximately  $1\frac{1}{2}$  in. to 2 in. back of the actual point of frog. The supports are spaced approximately equidistant on each side and slightly beyond the limits of wear on the hard center. Pressure is then applied along a line at right angles to the general line of the frog, forcing this portion down. The permanent set given the frog is the same or a little more than the amount in inches which the point has worn down and is measured on the press by getting the difference in height of the point before and after applying the pressure. When this has been done, the frog, when viewed from the side, appears to be bent in the shape of a very shallow or flat "V." Actually, so far as the surface upon which the car wheels

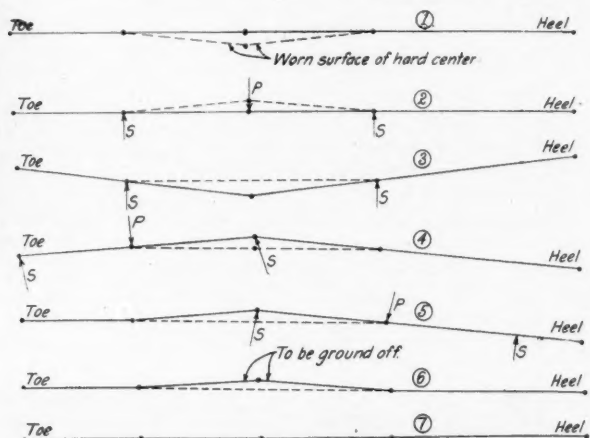
run is concerned, the shape of the frog is somewhat different. The worn part, low at the beginning of the operation, has now been pushed down, the frog still being turned over, to about the same level as the points of support. Thus, from point of support to point of support, the



A Worn Hard Center Frog with Renewed Wing Rails. White Lines Across Running Surface Mark Two of the Three Points of Flexure

running surface of the frog, when turned right side up, is approximately horizontal or very slightly convex longitudinally and also slightly convex crosswise because of the shape of the template used.

The frog is then placed right side up under the press and given two more permanent sets, the pressure being applied at the original points of support in turn. This brings the heel and the toe of the frog into the same general plane with the original point of support and the worn point of frog. Thus the unworn or renewed running surfaces are brought approximately into the same plane as the worn sections of the hard center. The frog is now placed in a grinder, where the irregularities are ground



Manner of Bending Hard Center Frogs

out, bringing the running surfaces down to a true plane. Where needed the flangeways are deepened and all edges coming in contact with the wheels are chamfered slightly.

This operation of pushing up the center, as it is called, is understood more clearly by referring to the drawing showing the line of the upper surface of the frog at each stage of the procedure. The solid line represents the upper surface of the wing rails and running rail after renewal of parts. The dotted line represents the line of the lowest or most worn surface of the hard center. The dots represent roughly the heel and toe of the frog and the points of flexure, while the arrows lettered "P" and "S" indicate the direction of the pressure and support, respectively. Only in Figs. 2 and 3 is the frog shown as being upside down.

We are indebted to W. L. Rice, superintendent of shops, and to James E. Lewis, foreman in charge of the frog and switch shop of the Philadelphia & Reading and the originator of this method for the above information.



# Maintenance of Way Employees Get New National Agreement

Labor Board Authorizes Straight Time for Work Done  
in the Ninth and Tenth Hours

ON DECEMBER 14 the Railway Labor Board issued a new national agreement with the maintenance of way employees which contains one provision that represents a marked change from the earlier agreement. Whereas the old rules, which had been in effect exactly two years, provided for the payment of time and one-half for all hours worked in excess of eight (except for the case of extra gang laborers who received straight time for the ninth and tenth hour), the new agreement provides specifically for the payment of straight time for the ninth and tenth hours in all cases. At the same time, the new rules definitely recognize the eight hour day by stating that "eight consecutive hours, exclusive of the meal period, shall constitute a day's work." By the elimination and modification of certain paragraphs the new agreement also has had the effect of allowing for a considerably greater latitude of action between the individual railroads and their employees in the perfection of local working conditions.

The new rules became effective on December 16 whenever the carriers and their employees have been unable to reach agreements. They are not to be applied where agreements have already been reached. If, for instance, a carrier has reached an agreement with its maintenance of way workers as to discipline rules, the new rules on this point are not to supersede the rules agreed upon, but if the same carrier could not reach an agreement as to the rules governing overtime, the new provisions are to be applied as the decision of the Labor Board on that disagreement.

## Important Changes in Some of the Sections

The national agreement with the maintenance of way employees was composed of six articles dealing with (1) the scope, (2) seniority, (3) promotions, (4) discipline and grievances, (5) hours of service, overtime and calls and (6) general conditions. Of these articles, two, those dealing with seniority and promotions, are remanded by the Board because almost all of the carriers were able to reach agreements with their employees on the new provisions to cover these subjects. Article IV, dealing with discipline and grievances, is approved in toto for the same reason. As a matter of fact, there were marked disputes on only six of the rules of the national agreement on the majority of the carriers.

Article V has been changed to provide straight time for the ninth and tenth hour for all hourly employees. This necessitated the elimination of the special paragraph applying to extra gang men as well as some other adjustments. That portion of the clause providing for the payment of punitive overtime where the reassignment of hours gave an employee more than ten hours' service is eliminated, making the payment of but pro rata rates necessary.

The clause requiring the payment of punitive overtime for working through regular meal periods is changed to provide for the payment of but pro rata rates.

The clause providing for the computation of the hourly rate of monthly paid employees on the basis of the number of days in the calendar year, multiplied by eight and divided by the total hours worked (exclusive of overtime

and disregarding time absent on vacations, sick leave, holidays or for any other cause) is changed so that the hourly rate is derived by dividing the monthly salary by 204.

Another change made is the elimination of pay to employees traveling in a bunk car between 10 p. m. and 6 a. m. The old agreement provided half time for these men presumably with the idea that they were entitled to some compensation because of disturbed rest while traveling. Another change is provision for the payment of one-half time instead of full time to employees not in outfit cars for the time spent in traveling by train outside of the regular working hours.

A much greater measure of discretion is allowed in the fixing of the working hours. Thus, Clause c-1 of Article 5 has been reworded as follows: "The starting time of any shift shall be arranged by mutual understanding between the local officers and the employees' committee based on actual service requirements." By this change the necessity for Articles c-2, c-3, c-4, c-5 and c-6 has been entirely done away with. Similar discretion is allowed for the fixing of the time and length of the lunch period.

The new agreement with the exception of Articles 2 and 3 covering seniority and promotion, which have been remanded, are published in full below.

## New Maintenance of Way Agreement

### ARTICLE I—SCOPE.

These rules govern the hours of service and working conditions of all employees in the maintenance of way department (not including supervisory forces above the rank of foreman), shop and roundhouse laborers (including their gang leaders), transfer and turntable operators, engine watchmen, pumpers, and highway crossing watchmen and all other employees performing work properly recognized as work belonging to and coming under the jurisdiction of the maintenance of way department, except as provided in decisions of the Railroad Labor Board on disputes submitted under Decision No. 119 for other crafts or classes.

They supersede all rules, practices and working conditions in conflict therewith.

### ARTICLE II—SENIORITY.

### ARTICLES III—PROMOTIONS.

(Articles II and III were remanded to those carriers and employees who have not agreed in regard to them for further negotiation and agreement, if possible.)

### ARTICLE IV—DISCIPLINE AND GRIEVANCES.

Advice of cause—Section (a). Employees disciplined or dismissed will be advised of the cause for such action, in writing, if requested, within 10 days.

Hearing. (b) An employee disciplined or who feels unjustly treated shall upon making a written request to the immediate superior within 10 days from date of advice, be given a fair and impartial hearing within 10 days thereafter and a decision will be rendered within 20 days after completion of hearing. Such employee may select not to exceed 3 employees to assist at the hearing.

Transcript. (c). A transcript of an employee's evidence when taken in writing will be furnished only to such employee upon verifying and signing same.

Copies for Committee. (d). A copy of all the evidence taken in writing at the hearing will be promptly made available for use of a properly constituted committee, when required in handling cases on appeal, of which notice has been given in accordance with section (e) of this article.

Appeal. (e). An employee dissatisfied with a decision will have the right to appeal in succession up to and including the highest official designated by the management to handle such cases, if notice of appeal is given the official rendering the decision within 10 days thereafter. The right of the employee to be assisted by duly accredited representatives of the employee is recognized.

Exoneration. (f). If the charge against the employee is not sustained, it shall be stricken from the record. If by reason of such unsustained charge, the employee has been removed from position held, reinstatement will be made and payment allowed for the assigned working hours actually lost, while out of the service of the railroad, at not less than the rate of pay of position formerly held or for the difference in rate of pay earned in or out of the service.

Pending Decision. (g). Prior to the assertion of grievances as herein provided, and while questions of grievances are pending, there will be neither a shutdown by the employer nor a suspension of work by the employees.

Leave of Absence. (h). Employees serving on committees, on sufficient notice, shall be granted leave of absence and free transportation, for the adjustment of differences between the railroad and its employees.

#### ARTICLE V—HOURS OF SERVICE, OVERTIME AND CALLS.

A day's work. Section (a-1). Except as otherwise provided in these rules eight consecutive hours, exclusive of the meal period, shall constitute a day's work.

(a-2). For regular operations requiring continuous hours, eight consecutive hours without meal period may be assigned as constituting a day's work, in which case not to exceed 20 min. shall be allowed in which to eat, without deduction in pay, when the nature of the work permits.

Hours paid for. (a-3). Except by mutual agreement, regularly established daily working hours will not be reduced below eight to avoid making force reductions.

When less than eight hours are worked for convenience of employees, or when regularly assigned for service of less than eight hours on Sundays and holidays, or when, due to inclement weather, interruptions occur to regular established work period preventing eight hours' work, only actual hours worked or held on duty will be paid for except as provided in these rules.

(a-4). Ordered eliminated.

Sunday work full-day period—(a-5). Except as otherwise provided in these rules time worked on Sundays and the following holidays: New Year's, Washington's Birthday, Decoration Day, Fourth of July, Labor Day, Thanksgiving and Christmas shall be paid for at the pro rata hourly rate when the entire number of hours constituting the regular week day assignment are worked.

Sunday work less than full-day period (a-6). Except as otherwise provided in these rules when assigned, notified, or called to work on Sundays and on the above specified holidays, a less number of hours than constitutes a day's work within the limits of the regular week-day assignment, employees shall be paid a minimum of three hours for two hours work or less, and at the pro rata hourly rate after the second hour of each hour of duty.

Overtime. (a-7). Ordered eliminated.

(a-8). Except as otherwise provided in these rules, ninth and tenth hours when worked continuous with regular work period shall be paid for at pro rata hourly rate; beyond the tenth hour shall be paid for at rate of time and one-half time on the minute basis.

Calls. (a-9). Except as otherwise provided in these rules, employees notified or called to perform work not continuous with the regular work period, will be allowed a minimum of three hours for two hours work or less and if held on duty in excess of two hours, time and one-half time will be allowed on the minute basis.

Service in advance of work period—(a-10). Except as otherwise provided in these rules, employees will be allowed time and one-half time on minute basis for service performed continuous with and in advance of regular work period.

(a-11). Ordered eliminated.

(a-12). Positions not requiring continuous manual labor such as track, bridge and highway crossing watchmen, flagmen at railway non-interlocked crossings, lamp men, pumpers, and at isolated points, engine watchmen, steam shovel, pile driver, crane and ditcher watchmen, will be paid a monthly rate to cover all service rendered. For new positions this monthly rate shall be based on the hours and compensation for positions of a similar kind. If assigned hours are increased or decreased the monthly rate shall be adjusted pro rata as the hours of service in the new assignment bear to the hours of service in the present assignment.

The hours of the employees covered by this rule shall not be reduced below eight per day for six days per week.

Exceptions to the foregoing paragraph shall be made for individual positions at busy crossings or other places requiring continuous alertness and application, when agreed to between the

management and a committee of employees. For such excepted positions the foregoing paragraph shall not apply.

Intermittent service—(b). No assigned hours will be designated for employees performing intermittent service, requiring them to work, wait or travel, as regulated by train service and the character of their work, and where hours can not be definitely regulated.

Beginning and end of day—(c-1). The starting time of any shift shall be arranged by mutual understanding between the local officers and the employees' committee, based on actual service requirements.

(c-2), (c-3), (c-4), (c-5), and (c-6). Provided for in c-1.

Meal period—(d-1). The time and length of the lunch period shall be subject to mutual agreement.

Work during meal period—(d-2). If the meal period is not afforded within the allowed or agreed time limit and is worked, the meal period shall be paid for at pro rata rate and 20 min. with pay in which to eat shall be afforded at the first opportunity.

Length of meal period—(d-3). Ordered eliminated.

Determining hourly rate—(e). To compute the hourly rate of monthly rated employees, divide the monthly salary by 204. In determining the hourly rate fractions less than one-half of one cent shall be dropped; one-half cent or over to be counted as one cent.

Travel time in camp cars—(f). Employees required by the management to travel on or off their assigned territory in boarding cars, will be allowed straight time traveling during regular working hours, and for Sundays and holidays during hours established for work periods on other days.

Authority for overtime—(g). No overtime hours will be worked without authority of a superior officer, except in case of emergency, where advance authority is not obtainable.

Supervisory employees—(h). Employees whose responsibilities, and, or supervisory duties require service in excess of the working hours or days assigned for the general force, will be compensated on a monthly rate to cover all services rendered, except that when such employees are required to perform work which is not a part of their responsibilities or supervisory duties, on Sundays or in excess of the established working hours, such work will be paid for on the basis provided in these rules in addition to the monthly rate. Section foremen required to walk or patrol track on Sundays shall be paid therefor, on the bases provided in these rules in addition to the monthly rate.

Assignments traveling—(i). Employees temporarily or permanently assigned to duties requiring variable hours, working on or traveling over an assigned territory and away from and out of reach of their regular boarding and lodging places or outfit cars, will provide board and lodging at their own expense and will be allowed time at the rate of 10 hours per day at pro rata rates and in addition pay for actual time worked in excess of 8 hours on the basis provided in these rules, excluding time traveling or waiting. When working at points accessible to regular boarding and lodging places or outfit cars, the provisions of this rule will not apply.

Reporting and not used—(j). Regular section laborers required to report at usual starting time and place for the day's work and when conditions prevent work being performed, will be allowed a minimum of three hours. If held on duty over three hours, actual time so held will be paid for.

Employees whose regular assignment is less than three hours, are not covered by this rule. (This paragraph is to cover regular assignments such as care of switch lamps or other duties requiring short periods on Sundays or other days for special purposes.)

Special Service—(k-1). Ordered remanded.

Absorbing overtime—(k-2). Employees will not be required to suspend work, after starting any daily assigned work period, for the purpose of absorbing overtime.

Reductions—(l). Gangs will not be laid off for short periods when proper reduction of expenses can be accomplished by first laying off the junior men. This will not operate against men in the same gang dividing time.

Travel time—(m). The employees not in outfit cars will be allowed straight time when traveling by train by direction of the management, during regular work period and one-half time rate during overtime hours, whether on or off assigned territory.

Employees will not be allowed time while traveling in the exercise of seniority rights, or between their homes and designated assembly points, or for other personal reasons.

Meals and lodging—(n). In emergency cases, employees taken off their assigned territory to work elsewhere, will be furnished meals and lodging by the railroad, if not accompanied by their outfit cars. This rule not to apply to employees customarily carrying midday lunches and not being held away from their assigned territory an unreasonable time beyond the evening meal hour.

Witnesses—(o). Employees required to attend court at the request of the management or to appear as witnesses for the railroad will receive the same pay per day for every day held as they would receive for the regular hours of their assignment. They



will be furnished necessary transportation and allowed necessary traveling and living expenses while away from home. Any fees or mileage accruing will be assigned to the railroad.

Composite service.—(p). An employee working on more than one class of work four hours or more on any day will be allowed the higher rate of pay for the entire day. When temporarily assigned by the proper officer to a lower rated position his rate of pay will not be reduced.

Female employees.—(q). The pay of female employees for the same class of work shall be the same as that of men and their working conditions must be healthful and fitted to their needs. The laws enacted for the government of their employment must be observed.

Work not performed.—(r). Ordered remanded. (Dec. 10, 1921.)

#### ARTICLE VI—GENERAL

Discrimination.—Section (a). There will be no discrimination on account of membership or non-membership in an association of employees. Employees serving on committees will, on sufficient notice, be granted leave of absence and such free transportation as is consistent with the regulations of the railroads, when called for committee work.

Consent to transfer.—(b). Except for temporary service, employees will not be transferred to another division unless they so desire.

Camp cars.—(c). It will be the policy to maintain camp cars in good and sanitary condition and to furnish bathing facilities when practicable and desired by the employees and to provide sufficient means of ventilation and air space. All dining and sleeping cars will be screened when necessary. Permanent camp cars used for road service will be equipped with springs consistent with safety and character of car and comfort of employees. It will be the duty of the foreman to see that cars are kept clean. When necessary in the judgment of the management, kitchen and dining cars will be furnished and equipped with stoves, utensils and

dishes in proper proportion to the number of men to be accommodated.

Water.—(d). The railroad will see to it that an adequate supply of water suitable for domestic use is made available for employees living in its buildings, camps, or outfit cars. Where it must be transported and stored in receptacles, they shall be well adapted to the purpose.

Week-end visits.—(e). Employees will be allowed, when in the judgment of the management conditions permit, to make week-end trips to their homes. Free transportation will be furnished consistent with the regulations. Any time lost on this account will not be paid for.

Tools.—(f). The railroads will furnish the employees such general tools as are necessary to perform their work, except such tools as are customarily furnished by skilled workmen.

Transferring household goods.—(g). Employees transferred from one location to another, by direction of the management, will be entitled to move their household effects without payment of freight charges.

(h). Employees transferring from one location to another, in exercising their seniority rights, will be entitled to move their household effects, without payment of freight charges, only once in each 12 months' period.

Local saving clause.—(i). Ordered remanded.

Printing schedule.—(j). Ordered remanded.

Controversies.—(k). Ordered eliminated.

Rates.—(1). Ordered eliminated.

Date effective and changes.—(m). This agreement shall be effective as of December 16, 1921, and shall continue in effect until it is changed as provided herein or under the provisions of the Transportation Act, 1920.

Should either of the parties to this agreement desire to revise or modify these rules, 30 days' written advance notice, containing the proposed changes, shall be given and conferences shall be held immediately on the expiration of said notice unless another date is mutually agreed upon.

## The Species of Wood Used for Ties

**F**. J. ANGIER, superintendent timber preservation of the Baltimore & Ohio, has compiled a statement showing the utilization of the various woods for cross ties by representative railways of the United States. This is shown in tabular form and is supplemented by excerpts from replies which Mr. Angier received from railway officers in answer to the questionnaire which he sent out soliciting information on this subject. The information compiled by Mr. Angier not only covers the woods used, but shows also which species are treated and which are used untreated. The replies from railway officers also contain some interesting facts concerning the tie purchasing methods of the roads.

A study of the table fails to disclose much in the way of general trends of practice. The chief fact of interest is that the practice of the roads is decidedly varied. One point worthy of note is that 6 roads treat heart white oak and that 11 of them treat sap white oak. When it is considered that only a few years ago the general consensus of opinion was that white oak did not require treatment, this indicates a definite change of opinion.

#### Excerpts From Replies to Questionnaire EASTERN ROADS

*Baltimore & Ohio.*—F. J. Angier, superintendent timber preservation: "We are at present using the U. S. Railroad Administration specification. We expect to revise this specification somewhat in the near future and some ties will probably be taken only on special contract, such as, for instance, gum, which we find deteriorates rapidly in the seasoning yards. We are also considering the matter of treating white oak ties."

*Central Railroad of New Jersey.*—C. M. Taylor, superintendent treating plant: "It is our present practice, and the policy is well established, to treat every tie."

*New York Central.*—Francis Boardman, division engi-

neer: "Our policy is to have all southern pine ties treated, whether heart or sap, but occasionally, in order to save time, or for other reasons, we are unable to get the treating done. This does not occur often."

*Pennsylvania System.*—John Foley, forester: "It should be borne in mind that the woods recorded as used are not all put in tracks throughout the system. Cedar and larch, or tamarack, are used only in the Michigan tracks of the Northwestern region. Very few catalpas, hackberries, locusts, mulberries or walnuts are obtained. Douglas fir was purchased only during a shortage of other woods, and only a few carloads of sap fir were received, in error."

*Philadelphia & Reading.*—C. M. Taylor, superintendent treating plant: "It is our present practice to treat every tie that goes into the track, except chestnut."

*Wheeling & Lake Erie.*—John Sesser, engineer maintenance of way: "Only recently have we gone into the question of treating our ties. Furthermore, we have adopted this year, as standard, the 7 by 9 by 8½ ft. tie. During the government administration there were shipped to this territory a number of fir ties. It, however, is not the plan to continue the use of this timber."

#### SOUTHERN ROADS

*Atlantic Coast Line.*—F. B. Hillegass, engineer maintenance of way: "We use heart cypress, heart pine and white oak ties. We have also used treated heart pine ties, but have not used any creosote ties since the beginning of federal control."

*Louisville & Nashville.*—R. M. Leeds, roadmaster: "Quite a number of chestnut ties were used in side tracks and branch lines in 1920, but for the past few months we have not been buying chestnut. Cherry, walnut and cedar in small quantities were bought and used as 'white oak.' We have not been buying gum lately."

*Illinois Central.*—E. H. Bowser, superintendent tim-





ber department: "It will not be long before we commence treating most of the white oak, but we are not doing it at present. We may cut out hickory, pecan and chestnut later. We will not use gum under any circumstances. We do not treat chestnut, but take them at the treatment tie prices and use them for light side track work. The objection to chestnut is that it is too soft and wears out more rapidly than loblolly pine. The objection to hickory and pecan is these woods often start to split when seasoning and the split will go all the way through."

#### WESTERN ROADS

*Atchison, Topeka & Santa Fe.*—R. S. Belcher, manager treating plants: "At the present time we treat practically all the ties we use with the exception of redwood and cedar. For the past four years these woods comprised only about 16 per cent of the ties inserted. These redwood and cedar ties are used on the Coast lines. Most of the ties inserted are pine, oak and gum. We treat such white oak ties as we receive and believe it is economy to treat them rather than to insert them untreated. We use red, black and tupelo gum, but get very little of the last named."

*Chicago, Burlington & Quincy.*—L. N. Hopkins, purchasing agent: "Practically all the ties that are received from points off our line for use on lines east are produced on the Tennessee, Cumberland and Green rivers. In addition to the woods shown on our local circular, we get a quantity of chestnut ties, which we use untreated. We also get ties of practically all the soft woods shown on the government specification, but our contract indicates that we prefer red oak only for treatment and the other kinds of wood are disposed of wherever possible to the best advantage. Our printed specification, effective July 15, 1921, states that no overcut water oak or pin oak accepted."

*Chicago, Milwaukee & St. Paul.*—F. S. Pooler, tie agent: "We have been following the classification outlined in the U. S. Railroad Administration specification, except we do not treat sap cedar, black cherry or butternut."

*Chicago, Rock Island & Pacific.*—C. F. Ford, supervisor tie and timber department: "I believe we are justified in treating all white oak ties, as it has been our experience that very few all heart ties are produced on our territory. I expect to make a report to our people as soon as I can get some additional information."

*Duluth & Iron Range.*—W. A. Clark, chief engineer: "Most of the ties used by this company for many years have been tamarack, which we have used and are still using untreated. I am satisfied, however, that it would be economy to treat them, if it could be done at any reasonable expense. Our requirements are not large enough to make it desirable to build a plant of our own nor to offer sufficient inducement for a treating company to build one in this district, and there is no treating plant nearer than Minneapolis. We have not been successful in getting any other roads to join with us in this effort and I do not see any immediate prospect of treating this class of ties. We have, however, purchased some red oak ties in the south which were treated in transit."

*Missouri Pacific.*—W. J. Burton, assistant valuation engineer: "We accept ties other than those shown on the blank, but, as a practical matter, we receive very few other ties. The question of treating white oak ties has been given consideration, and a portion of these ties will be treated. We now have white oaks seasoning preparatory to treatment."

*Pere Marquette.*—H. A. Cassil, engineer maintenance of way: "The fact that we are not using all of the kinds of ties shown on the blank does not mean that we consider them not fit for use, but simply that we are not

using them. Our experience in general has been that the northern white oak does not require treatment, but white oak from southern and southwestern territory can hardly be called white oak, but has a very open grain and requires treatment about the same as red oak."

*Southern Pacific Lines.*—F. D. Mattos, manager treating plants: "Our tie renewals are made up of fir, Port Orford cedar and redwood. The fir ties are the only ones that require treatment, the cedar and redwood ties being durable in contact with the soil."

*Wabash.*—T. J. Frier, purchasing agent: "We do not purchase heart cypress. If we did we would not treat it."

## The Labor Board Considers Contracting of Maintenance

ON DECEMBER 20, the United States Railway Labor Board conducted a hearing on several controversies between the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers and several of the railroads concerned alleged unfair practices in the contracting of various operations of maintenance of way. These cases have been taken under advisement and no decisions have yet been reached.

In presenting these cases to the board, G. F. Grable, president of the maintenance of way brotherhood, protested the action of the railroads for several reasons: First, that the contracting constituted a violation of the intent of the Transportation Act; second, that the Act provided a method for settlement of disputes between the railways and their employees; third, that the contracting of the work removed the employees from the protection of the board; fourth, that the Transportation Act provided for the conduct of labor matters concerned in railway upkeep under the jurisdiction over the board, and fifth, that the contracting of the work is a violation of the Transportation Act not only as to the regulation of labor, but also as to supervision of railway operation by the Interstate Commerce Commission.

The first case presented was that of the Chicago Great Western, in the contracting of track work to the A. S. Hecker Company, the men being employed by the Hecker company to work under section foremen employed by the Chicago Great Western. As no one was present to represent the Chicago Great Western, no extended testimony was given on this case.

Another case was that of the St. Louis-San Francisco in connection with the contracting of service at pumping stations, contracts being arranged with individuals for the pumping of water at these stations. Instead of receiving an hourly wage or a monthly salary the men entered into contract with the railroad to do the pumping at one or more stations for a stated amount per month. Similar contracts were entered into for the duties of coal passers at small coaling stations.

A somewhat different arrangement in contracting work of this character which was brought before the board was that of the Colorado & Southern for the handling of pumping operations at water stations requiring the services of a man but a few hours per week. The railroad laid off its pumpers and made contracts with station agents, operators, section foremen and track laborers, to perform the services of pumpers in addition to their regular duties for a small stated sum each month, \$10 being cited in the testimony. Testimony in this case brought out the fact that the water stations involved in most cases were those where the consumption of water was small and only a very limited amount of pumping was required. It was also shown that many

of these stations were located on lines of the Colorado & Southern having very limited earnings, making it necessary to economize in every way possible.

By far the greatest amount of attention was given to the Indiana Harbor Belt in relation to its contract with Colienni & Dire for track labor, dated April 30, 1921. This is essentially a force account contract under which the contractor carries on all the maintenance of way operations and receives five per cent commission on the labor bill. Testimony developed that whereas the foremen had largely been in the employ of the railroad under this arrangement for some time, they were later turned over to the contractor. The contractor's men were paid 38 cents an hour and were recruited by the contracting firm through its labor recruiting establishment in Chicago, testimony being offered to show that the men paid a \$7 fee for employment. George Hannauer, vice-president and general manager of the Indiana Harbor Belt, in testifying before the board presented some figures showing that the cost of conducting various maintenance of way operations had been greatly reduced as compared with results last year and that he believed that the contracting of the work had been one element in obtaining this result.

### Decisions of the Labor Board

**A**MONG THE decisions of the U. S. Railroad Labor Board which have been handed down during recent months are several which are of interest to maintenance of way employees:

#### Length of Leave of Absence for General Committee Work

A foreman on the Kansas City, Mexico & Orient was granted a leave of absence for six months to perform the duties of general chairman representing employees affiliated with the maintenance of way brotherhood. Prior to the expiration of this leave, he applied for and secured an extension of six months additional. Prior to the expiration of the second period he applied for a further extension of six months, which was denied. The employee in question did not then report for work at the expiration of his leave and the carrier removed his name from the seniority roster.

The employees contended that the general foreman in question found it necessary to devote his entire time to committee work and adjusting grievances and in accordance with rulings of the Railroad Administration and provisions of the National Agreement should have been granted such extensions as might be necessary to enable him to carry on this work.

In its decision the Labor Board sustained the position of the employees and directed the road to restore the foreman to the seniority roster with his standing prior to the expiration of the last leave granted by the carrier. (Decision No. 230.)

#### Extra Pay for Work Outside of Regular Duties Denied

In another case, brought by the maintenance of way brotherhood against the Missouri Pacific, request was made for the application of the rate for water service helper for a section laborer for work performed incident to the laying of water and sewer pipes at Hoxie, Ark. About March 19, 1920, a force of employees were engaged in installing new pipe lines in connection with a new water tank, standpipe, cinder pit and drains to a sump at Hoxie. Several section laborers, including the complainant, were assigned to certain duties in connection with this work, such as digging trenches for laying the

water pipe, sewer pipe and drain pipe, assisting in the handling of the materials to the trenches and lowering the pipe into the trenches and also in the raising of the pipe so that it could be adjusted to the joints in the trenches and backfilling after the pipe was laid.

The Labor Board in its decision held that the carrier was within its rights in assigning the complainant to assist in the performance of the work in question without changing the classification and rating. The board stipulated, however, that this decision was not to be construed as lending the approval of the board to the assignment of laborers at laborers' rates to perform work regularly recognized as that of mechanics' helpers. (Decision No. 260.)

#### Section Foreman Not Reinstated

The Railway Labor Board on November 19, 1921, declined to reinstate W. E. Rumpy, formerly section foreman employed on the Texas & Pacific at Forney, Tex. Mr. Rumpy was discharged from service on May 3, 1920, because of alleged responsibility in leaving a switch open at the end of a house track, thereby causing a derailment of a passenger train, March 19, 1920. (Decision No. 398.)

#### Ash Pit Men on the Nashville, Chattanooga & St. Louis

On the Nashville, Chattanooga & St. Louis a dispute arose with respect to the pay for ash pit men and employees of the maintenance of way department who are required to clean up cinders dumped on the main line or other tracks from engines or through trains stopping for coal or water. It was the contention of the employees that they were performing the same class of work as cinder pit men and that they should be classified and rated the same as cinder pit men. The contention of the road was that the labor performed by the men who handled cinders from tracks where there are no cinder pits does not come within the scope of that performed by "ash-pit men," where cinders are usually handled very hot or very wet, and the atmosphere is charged with sulphurous fumes.

The decision of the Labor Board is as follows:

"The Labor Board decides that at points where there is a sufficient amount of this work to occupy the time of one or more men, such men (or man) shall be paid the rate and receive the overtime conditions established for ash-pit men. This decision shall not be construed to mean that section laborers or other laborers employed in and around shops or yards, who are required among their other duties to remove cinders from tracks, shall come under the provisions of the preceding paragraph." (Decision No. 300.)

#### Hoisting Engineers Not Entitled to Machinists' Pay

The Labor Board issued a decision on November 19 relating to the classification of hoisting engineers employed by the Central Railroad of New Jersey for transporting cars over an incline plane. In a complaint registered by the United Brotherhood of Maintenance of Way Employees' and Railway Shop Laborers, the contention was made that these men are being required to make certain repairs and do mechanical work on the equipment which they operate and that also in 1907 they were paid the maximum rate awarded machinists, because of their doing machinists' work, and that, therefore, they should be paid mechanics' wage in accordance with Supplement No. 4 to General Order No. 27 and the National Agreement covering the Federated Shop Crafts. In its decision, the Labor Board denied the employees' claim for reclassification and rating. (Decision No. 397.)



# Improvements in 1921 Were Limited

## A Review of the Record for the Past Year Shows Continued Restriction in Construction and Equipment

**T**HE YEAR 1921 from the standpoint of construction and equipment has been one of exceptional quiet. While this was to have been expected, because of the financial condition of the roads, some of the low records which have been established this past year are equal to, or nearly so, the worst that have occurred in practically the history of the railroads. Some slight encouragement may be had from the fact that the mileage of new track which was built during the year did increase a small amount over that for 1920, which was, however, the low record for the roads since the Civil War. There was also a slight increase in the mileage equipped with block signals, but when other factors are considered this increase, as well as that for new track, is almost of a negligible character. The orders for locomotives, freight and passenger cars were abnormally low, and, in fact, showed an almost complete stagnation in the equipment line. Foreign orders were also low, but did indicate a tendency toward the adoption of heavier power in many of the countries.

### Mileage of New Lines Shows About 40 Per Cent Increase

The only indication of any renewal of activity, no matter how slight, that was evidenced, outside of the small increase in block signalling, was that in 1921 there were 475.10 miles of first track completed in comparison to 313.71 miles for the previous year. This figure is far below the corresponding figures for the years preceding the world war and even when compared with the figures during that period, are only about from one-half to one-third of what was then considered small mileage. The total miles constructed, that is, first, second and other multiple track, also increased, reaching 642.22 miles as compared to 414.35 miles of 1920. Of the 1921 figures, 143.07 miles and 25.26 miles were second and third track, respectively. In 1920 only 90.87 miles and 1.89 miles of second and third track were completed. In Canada, on the other hand, there was a considerable decrease in mileage construction, there being only 251.48 miles of first track completed during the year, which very closely approximates the low record for that country in 1918. The building of new lines in Canada has been at low ebb since 1914 and as a great part of that country's railway mileage is government owned and as the government railways as a whole are earning a large deficit each year, it is doubtful if there will be much increase in building for some time to come.

Of the past year's work, the completing of the Government Railway of Alaska produced the greatest miles built by any one road for the year, or a total of 81.95 miles. The majority of the first track mileage for the United States was divided approximately between seven states, with Texas leading with 63.60 miles and Florida second with 59.90 miles. The other five states ranged between 40 and 50 miles. In miles of all track constructed, West Virginia led with 66.42, of which 21.52 miles were second track. This increase of first and second track in the state of West Virginia is due primarily to the development of the coal territory in parts of that state, which is still virgin. Practically all of the second track built in the state, for example, is the work of the Chesapeake & Ohio in double tracking its line up the Guyandot river into the Logan coal fields. The develop-

ment in Texas is quite similar except that the incentive was due chiefly to oil and the other products which are necessary in carrying out a development of that class. In Florida, the case was somewhat different, the necessity arising more from agricultural reasons. The greater part of Florida's new mileage lies in the vicinity of Lake Okeechobee and the northern fringe or more thoroughly drained sections of the Everglades. This drainage work has opened up large acreages of rich agricultural lands, and quick settlement and development of which has hinged upon adequate transportation facilities. This work of railway building is, in a sense, not unlike the pioneer building of the older days.

### General Construction Work Chiefly Heldover Projects

A point which was noticed last year in the statistics for 1920 and again seen this year, is the distinct manner in which the railways have expended their money to secure the greatest possible return in operating economies for the least possible expenditures. Naturally that is the endeavor at all times, but in times when money is more plentiful the work is carried out more to effect future and more permanent economies rather than temporary, as has been the case during the last several years. The marked decrease in the traffic for 1921, as compared with preceding years, the heavy operating expenses and many other factors no doubt created an uncertainty regarding the amounts of money, which would be available during the year for improvements, that was subsequently justified. As a result the only work of any magnitude which was performed in 1921 was, with a few exceptions, work carried over from preceding years which was so important and needed that it could well be carried ahead. The only project of size which, in truth, was started in 1921 and has been pushed along rapidly is the grade separation of the Delaware, Lackawanna & Western at East Orange, N. J.

### Mileage Abandoned for Operation Is Large

Since the year 1921 was a difficult one for the railways, it is not altogether surprising that operation was suspended or discontinued on 1,791 miles of line in the United States. To this amount there should be added 51 miles upon which operation was suspended or discontinued during the latter part of 1920, but which were received too late to be included in the statistics for that year. This brings the total up to 1,842 miles, or over 1,200 miles more than were constructed in the same period. Of this total mileage abandoned for operation, 217.09 miles were abandoned completely and the lines taken up and junked—a slight decrease from the corresponding figure for 1920. The remaining mileage consists, in a large part, of small lines which have been forced to cease operation because of the severe conditions encountered during the year and upon which it is not improbable that operation will be resumed as soon as the times become more nearly normal.

Another point of interest is the mileage represented by the applications made to the Interstate Commerce Commission for abandonment and that which has been authorized during the calendar year, which is not already included in the figures given. For 1921 this amounts to a total of 396.32 miles for which applications have been made, but regarding which no action has as yet been re-

ported publicly. In addition there is a total of 191.01 miles which the commission has authorized to be abandoned, which, when included with the rest, makes a total of 2,430 miles upon which operation has actually been abandoned or which the abandonment has been applied for or authorized. Outside of the state of Colorado, in which fully one-fourth the mileage abandoned occurred, the major part of the lines abandoned was in the southern states from one coast to the other. Two of the roads which have been unable to continue operation and which form the greater part of Colorado's mileage are the Colorado Midland and the Colorado Springs & Cripple Creek District. Arkansas also contained a heavy mileage for one state, having a total of 223 miles upon which operation has actually been discontinued or the track taken up. The mileage in prospect for the state of Michigan is also high and is made up almost entirely of short sections and branches of the Pere Marquette, of which, however, only a small part has been abandoned to date, the remainder being covered by applications before the commission and not yet authorized. The largest of the roads which were forced to abandon operation was the Missouri & North Arkansas, with 365 miles, which stopped because of light traffic and heavy expenses that consisted chiefly in their case of high wages. This road offered to resume operation if the employees would accept a 25 per cent reduction, with the understanding that if there was any surplus left after paying expenses, taxes and interest, it would be divided among them up to the point where their wages were on a par with the employees of other roads. The plan was refused. The road is now before the Labor Board for the necessary authority to make this cut.

Although there are a number of roads upon which operation will be resumed without much doubt, there is a considerable mileage which is more likely to be discontinued permanently as common carriers if not junked altogether. Much of the mileage upon which operation has been discontinued or applied for, serves timber territory that has since been worked out, either entirely or to such a point that it is no longer a traffic-producing factor of any importance. With the passing of this timber there has not been sufficient traffic to justify the continuation of these lines or branches as common carriers, although they might have continued to exist under more normal circumstances for many years yet, had not the severity of 1921 as a railroad year intervened and brought to a conclusion what would have occurred eventually.

#### Signal Construction in 1921

During the past 12 months the total block signal mileage completed in the United States and Canada was 792.8 miles, as compared with 523.5 miles of road in 1920. Of the total for 1921, 206.9 miles represent installations of the manual block, leaving 585.9 miles of new automatic block signals. The last named figure is 64.1 miles more than the mileage of new installations of automatic block signals during 1920.

One notable feature of the year's work has been that, in general, the construction of block signaling has been confined to short sections of line, such as station and curve protection, shortening of block sections and better facilities for yard approaches, etc. Figures for interlocking construction during 1921 show that 60 plants were constructed in the United States and six in Canada. This compares with 43 and 2 for the United States and Canada, respectively, in 1920.

At the close of the year the work under construction or in progress was somewhat less than that at the close of the preceding year and is contained exclusively in the United States, no Canadian roads having reported any work in progress. This construction consists of auto-

matic block signaling entirely, some of it being to replace manual blocking and some to replace one type with another. The work proposed for 1922 also shows a decrease over the work which has just been completed, representing, as it does, 545.5 miles to be equipped.

A review of the conditions during the past year indicates that the tendency is toward better train operation by signaling selected stretches of double track lines for movements in either direction on either track. The movement of tonnage trains has also been facilitated in some localities by the installation of grade signal aspects. Railway men in general have shown a keener appreciation of the value of automatic signaling with reference to its use in effecting economies in train operation.

Automatic train control is being given active consideration by the railroads, by the Interstate Commerce Commission and by the Joint Committee on Train Control of the American Railway Association. One road is adding to its present installation and others are arranging to test out devices.

#### Car and Locomotive Orders in Quiescent State

The orders placed during 1921 for locomotives for domestic service totaled 239, as compared with 1,998 in 1920, or about one-eighth the business that was done in the previous year. The figure for 1921 is but slightly better than the low record of 1919, the second year of federal control, when the total locomotives ordered for domestic service was only 241. Orders placed in Canada by the railroads were 30, as compared with 187 in 1920. The export locomotive orders aggregated 546, inclusive of the orders placed by lines in Mexico. This figure was 718 in 1920 and 858 in 1919. The National Railways of Mexico placed the largest orders for any one system, having ordered a total of 142 locomotives.

Production of locomotives during the past year was 1,121 for domestic service and 990 for export. This compares poorly with 2,162 for domestic service in 1920 and is the lowest since 1897. The greater part of the orders placed this year were of small size and are interesting only in that they show an increasing use of Santa Fe and mountain types of locomotives, since a large proportion of the orders were for these types. The foreign countries which furnished the bulk of the export orders were in addition to Mexico already mentioned, Argentina, Chile, China, Brazil and Japan. Much of this business was obtained in spite of keen competition.

The orders for freight cars in 1921 for domestic service were the lowest on record, reaching the remarkably low figure of 22,627, or very closely one-fourth of the 1920 orders, which were 84,207, and considerably less than the 1919 orders of 25,899. Export orders totaled 4,982 in 1921, one-half the total for 1920 and in excess of the 1919 figures, but less than one-tenth the average for 1917 and 1918. The 1921 orders were so few that the year was spent primarily in cleaning up the hold-over business of the previous year, with the result that there was a minimum production, the totals for the year being 40,354 cars for domestic service and 6,434 for export.

Passenger car orders were also low, being the lowest on record for any year except 1918. The totals for 1921 were but 236 for domestic service and 155 for foreign service. The passenger car production, as distinguished from orders, was 1,013 and 39 for export. Only two American roads, the New York, Ontario & Western and the Philadelphia & Reading, placed fair sized orders, the two roads ordering 32 cars and 50 cars, respectively. In the export field, South America and China were the largest buyers. All of the Chinese orders and a part of the South American ones specified all-steel.



## *Railway Affairs at the National Capital*

Washington, D. C.

**T**HE PROSPECTS of the railroads for the coming year are now largely dependent upon the outcome of an investigation instituted by the Interstate Commerce Commission by an order issued on November 23 "to determine whether and to what extent, if any, further general reductions in the rates, fares and charges of carriers by railroad applicable in interstate or foreign commerce can lawfully be required by order or orders of the commission under section 1 or other provisions of the interstate commerce act, upon any commodities or descriptions of traffic, and also to determine what will constitute a fair return from and after March 1, 1922, under section 15-a of the interstate commerce act." Hearings in this investigation were begun before Commissioners Aitchison, Esch, Hall and Lewis at Washington on December 14 and after four days of preliminary testimony by the railroads an adjournment was taken to January 11. Although the proceeding was ordered by the commission upon its own motion it is in accordance with a petition filed by the Association of Railway Executives and is also in accordance with requests made at various times during the year by shippers' organizations.

The railroads are proceeding as rapidly as possible to get their applications for wage reductions before the Labor Board, with a promise that any savings that may result will be devoted to rate reductions. Meanwhile they have taken the position that there should be no further rate reductions, except in particular cases to effect readjustments or to meet special situations, except a general reduction of 10 per cent for an experimental period of six months on agricultural products. Their petition asked that the commission allow a rehearing of the case in which it had ordered a more extensive reduction of the rates on grain and hay in the west, allow them to substitute the 10 per cent reduction and order an investigation to determine whether any further reductions can lawfully be made at this time in view of the fact that the roads have fallen far short of a 6 per cent return and have no immediate prospect of realizing it.

Just before the beginning of the general hearing the commission heard arguments on the petition for the reopening of the grain case, at which the railroads asked that the order be suspended for six months, and they were so confident that the request would be granted that they promised to make the 10 per cent reduction anyway, but the commission, on December 16, refused to

rehear the grain case and the railroads were therefore faced with the alternative of making both reductions. The grain order was effective on December 27 but has since been postponed until January 7 to allow more time in which to prepare the tariffs, and the 10 per cent reduction is to be made on January 1. The New England roads were originally left out of the 10 per cent reduction because of their unfavorable financial condition, but the New England shippers insisted so vigorously upon being included that the roads asked permission to make the reductions at the same time as the other lines.

It was estimated that the commission's order would reduce the revenues of the western roads by \$33,000,000 and that the more general reduction would increase this by \$50,000,000 or \$60,000,000 a year.

### **First Hearing Completed December 17**

The first stage of the hearings was completed on December 17. The preliminary testimony consisted of statistical statements from the three districts showing the present financial condition of the railways and the results attained under the advanced rates as well as under the reduction in wages and in other expenses made in recent months. This showed that for the twelve months ended September 30, 1921, the eastern roads had earned a net operating income of 2.75 per cent on the tentative valuation prescribed by the commission in the rate decision, while the Southern roads had earned 1.8 per cent and the Western roads 3.04 per cent. While it was shown that these percentages had been considerably exceeded since July and in October had reached an average of 5.4 per cent for the roads as a whole, it was also shown that traffic had fallen off considerably in November and December and it was estimated that the net return for those months would show reductions.

The attitude of the carriers toward further rate reductions was stated by the traffic executives, who all testified that the present rates are yielding the railroads an inadequate return and in the aggregate are not unreasonably high, considering the cost of transportation, that thousands of reductions had already been made, many of considerable extent, by way of readjustments and to meet the requests of shippers, and that in general rates should not be further reduced until the roads have had further opportunity to reduce their expenses. They asserted that freight rates have not been the cause of the depression in business and that, in general, further decreases would



not stimulate business materially because of the many other factors that tend to retard the restoration of traffic.

#### Commission Hopes for Lower Rates

The annual report of the Interstate Commerce Commission, covering the year ended October 31, 1921, submitted to Congress, says that perhaps the most difficult task now confronting the commission, and certainly the one of greatest importance to the public, is the readjustment of freight rates, which is necessitated by the changing conditions attendant upon the recovery of this country and others from the effects of the World War. The commission is "hopeful that with an improvement in the volume of traffic and with a further adjustment of operating costs in harmony with prevailing tendencies, a substantially lower level of rates and fares will be compatible with the rule of rate-making which has been prescribed by the Congress and at the same time permit an adequate maintenance of the properties."

#### Net Operating Income for October 5.4 Per Cent

Reports of the earnings of the Class 1 railroads for the month of October filed with the Interstate Commerce Commission show a net operating income of \$105,186,283, which is at the rate of 5.4 per cent a year on their tentative valuation. This is the largest net operating income the roads have had for a month since the rates were increased and is 21.8 per cent greater than that for October, 1920, which was the best month they have had heretofore since the rate decision. October is normally the heaviest traffic month of the year and, due to the threat of a railroad strike, the volume of freight for the latter part of the month was beyond normal. The ton miles of freight handled in October were approximately 36,000,000,000, a decrease of 14 per cent as compared with October, 1920. This was lower than the ton mileage for any October since 1916. The total operating revenues for the month were \$535,135,126, a decrease of 16.6 per cent as compared with October, 1920, while the operating expenses were \$397,114,777, a decrease of 24.6 per cent. The maintenance expenses were \$184,480,060, a decrease of only 20.1 per cent as compared with last year. The operating ratio this year was 74.2 per cent as compared with 82 per cent last year.

For the 10 months of 1921 ended October 31, the net operating income of the Class 1 roads has been \$494,606,000, which is at an annual rate of return of 3.2 per cent. Operating revenues for the 10 months show a decrease of 8.1 per cent and operating expenses show a decrease of 17.1 per cent. That this was accomplished to a considerable extent at the expense of maintenance is shown by the fact that the maintenance expenses decreased 21.7 per cent.

#### Director General Reports on Railroad Settlements

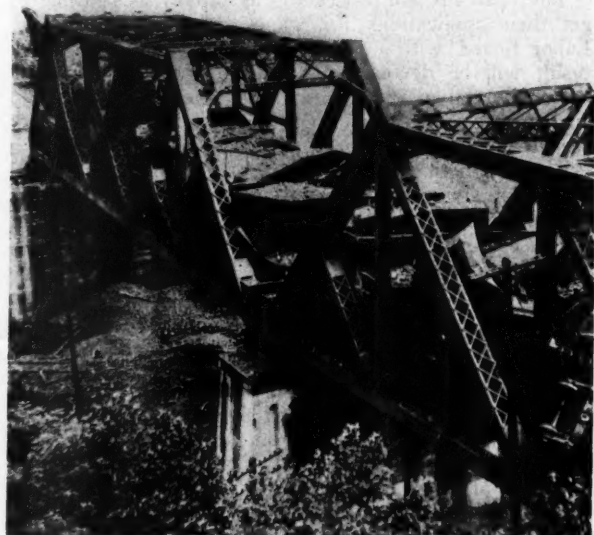
A comprehensive report on the status of the accounts of the Railroad Administration with reference to the settlement of the claims of the railroads growing out of federal control was transmitted to the Senate on December 10 by Director General James C. Davis in response to a resolution adopted by the Senate on November 22 on motion of Senator LaFollette. The amount due the carriers from the government as of December 1 on accounts growing out of federal control, including compensation, money taken over, maintenance, materials and supplies, depreciation and all other accounts, exclusive of additions and betterments, was estimated by the Railroad Administration at \$750,670,588.69, while the railroads owed the government a balance of \$507,628,508.27 on account of additions and betterments undisposed of as of December 1, leaving a balance of cash required for final settlement, based on the estimate of the Railroad

Administration and assuming that the balance due on additions and betterments would be collected by deduction from the indebtedness of the government to the roads, of \$243,042,080.42.

The available cash assets of the Railroad Administration were \$152,380,880.42 on December 1, and it also held securities of the roads including equipment trust certificates which the President has express authority to sell and of which \$109,000,000 had been sold up to December 1. "While general authority to sell other obligations may exist," Mr. Davis said, "no express authority is found granting this power." Up to December 1 final settlements had been made with the carriers of claims aggregating \$436,145,307.31, representing 107,063 miles of road or 44 per cent of the entire mileage (exclusive of short lines) under federal control. There was paid in final settlement of these claims \$132,221,839.99. The number of final settlements was 151 but these included 64 subsidiary companies, so that final settlement has actually been made of the accounts of 215 federally controlled carriers. The total claims filed up to December 1 in final settlement aggregated \$940,587,256.59, representing 208,721 miles of road. If the remaining roads, 32,473 miles, file claims on the same basis it is estimated that the total amount of claims will be about \$1,100,000,000.

In the settlements that have been made \$179,710,117 of additions and betterments were charged to the carriers and \$33,443,000 was funded, leaving a balance of additions and betterments yet to be adjusted of \$507,628,508, either to be funded in such an amount as the administration may refrain from setting off those claims against amounts due the carriers from the government, or deducted from the amounts due from the government to the carriers.

The report shows that the Railroad Administration since its organization has had at its disposal funds amounting to \$3,478,872,520, exclusive of the revenues of the individual railroads, which passed through their own accounts. This included direct appropriations of Congress amounting to \$1,750,000, \$800,000,000 of working capital taken over with the property of the companies and \$221,705,000 paid by the War Department for transportation, \$11,359,000 by the Navy, and \$65,575,000 by the Post Office.



A Severe Bridge Test, or What a Derailment Can Do

# WHAT'S THE ANSWER?



This department is an open forum for the discussion of practical problems of maintenance of way and structures. Readers are urged to send in any questions which arise in their work in the maintenance of tracks, bridges, buildings and water service. The *Railway Maintenance Engineer* also solicits the co-operation of its readers in answering any of the questions listed below.

The following questions will be answered in next month's issue:

- (1) What is a reasonable distance between section car setoffs, and should they be placed on the inside or outside of curves?
- (2) How should a trackman safeguard himself when on sweeper duty in a snow storm?
- (3) How should brine be prepared for winter use in water barrels on bridges?
- (4) How should concrete materials be heated in cold weather?
- (5) What is a good method for sanding paint coatings on stations and other railway buildings?
- (6) Is the use of storm windows practical and economical on railway stations?
- (7) What equipment and methods are most advantageous for the cleaning of sanitary or storm sewers or treating plant sludge lines that have become partially filled with sediment?
- (8) All pump jacks for well pumps and all gear drive wheels on combination pumps provide for two or more adjustments in the stroke of the pump. What considerations determine which strokes to use?

## Heating Stone For Masonry

*Inasmuch as present practice requires pre-heating of all concrete materials in cold weather and the heating of masonry stone is usually impracticable, how should the laying of stone masonry be handled in cold weather?*

### First Answer

The fundamental precautions required in the placing of concrete apply also, but in somewhat less degree, to the laying of stone masonry. I quote below one paragraph included in the Lehigh Valley specifications for masonry, dated January 1, 1906:

"No masonry will be laid in freezing weather or in winter, without special permission, and then only under such instructions for heating of water and sand, adding of salt, thawing and cleaning of stone, and covering work at night, as the engineer may issue."

It is evident that the stone used either in the face or backing of the wall must be thawed out and cleaned of any frozen dirt or ice that may have formed on the surface. It is equally evident that the water and sand shall be heated so as to keep the mortar from freezing before the stones it is to bind together have been set. The setting of the stone will in a measure protect the mortar in the joints from freezing except on the exposed faces where the frost will act, the same as in concrete, but to a lesser extent, as the mortar for stone masonry contains less water than does the ordinary concrete.

The quantity of water used in the mortar for stone

masonry, to be laid in cold weather, must be reduced to a minimum and the stone laid upon the bed of mortar as quickly as possible and the frost kept from the mortar, by artificial heat or other protection, until the mortar has thoroughly set. The laying of stone masonry in cold or freezing weather should be avoided if possible, but if necessary to be done in such weather the precautions necessary for concrete work will have to be applied in the laying of stone masonry, to obtain the desired results.

F. E. SCHALL,

Bridge Engineer, Lehigh Valley, South Bethlehem, Pa.

### Second Answer

I think there is no question concerning the desirability of pre-heating all concrete materials in cold weather. Also, it is desirable, so far as practicable, to heat the stones in stone masonry, or at any rate to take the frost out of them, to make a first-class job. In extreme cold weather large blocks of stone sometimes freeze, and if laid up in a frozen condition with only thin layers of mortar between them, even though the mortar may be heated, the cold mass of stone is liable to chill, and even freeze the mortar before it has time to properly set.

One way to heat large stones for this kind of work is to lay them up in circular courses, similar to a cylinder, around a coal or wood fire built in the center, and keep them there long enough to remove the frost from the stone before putting it in place in the wall. In ordinary cases, this can be done with comparatively little lost time, as the derrick which is used for placing the stone in the

wall can generally handle them from where they are unloaded, and stack them up cylindrically around the fire, working spirally in using the stone, so as to take them off in approximately the same order in which they are placed around the fire. The size of the fire can be governed by the size and number of blocks of stone, and the speed with which they are used. The mortar, of course, should also be heated in extreme cold weather before placing it in the joints. In the case of limestone masonry it may be necessary to exercise some care to avoid heating the stone enough to damage the surface, and possibly form quicklime.

R. H. REID,

Supervisor of Bridges, New York Central, Cleveland, Ohio.

## Formulas for Whitewash

*How should whitewash be made in order to get the most effective service?*

I have obtained good results with a lime whitewash which was used on wing fences at highway crossings and elsewhere. This was made as follows: Slake  $\frac{1}{2}$  bu. of lime with boiling water, keeping it covered with burlap during the process, strain and add one peck of salt dissolved in hot water. Also dissolve 3 lb. of rice flour in hot water and boil to a thin paste; dissolve  $\frac{1}{2}$  lb. of whitening in warm water and add to the rice flour; also dissolve 1 lb. of glue in hot water and add to the flour and whitening. Mix these ingredients well and add them to the lime and salt. When ready for application heat the whole mixture in a kettle or portable furnace and apply warm with either a brush or spray.

Another formula consists of the lime and salt mixture exactly as above, but in place of the rice flour, whitening and glue, I add 7 or 8 lb. of rendered hot beef suet. It is also possible to use the lime and salt mixture without any additional ingredients, but this does not give as good results.

F. C. RIEBOLDT,

Foreman Painter, Chicago, Milwaukee & St. Paul, Milwaukee, Wis.

## Closing Up Expansion Joints

*What is the most practical method of driving back the rails to close up wide expansion openings?*

This is a very live topic. We all know that more rail is ruined by too much expansion at joints than any other way. My experience has been the best and most practical way to drive up expansion is to loosen up all the bolts and remove a joint every 10 rails and raise up the end of rail about one inch, then take a 33-ft. rail and with 18 or 20 men, set it up on the traffic rail and use it as a ram to drive the rail back tight where the joints have been loosened and keep on moving it ahead in this manner until all joints having too much expansion has been driven tight.

There are different devices on the market for closing up expansion, but none of them have as yet been as successful as driving the steel tight with a rail used as a ram.

T. THOMPSON,

Roadmaster, Atchison, Topeka & Santa Fe, Joliet, Ill.

## The Proper Position for a Check Valve

*Is a check valve's location and position with respect to a displacement pump of any consequence from a standpoint of the efficiency of the pumping system? If so, what is the general rule for installing such valves?*

The purpose of a check valve in the discharge line from a pump is to keep the water in the discharge pipe when the pump is open for inspection and repairs. It also relieves the pressure on the discharge valves when start-

ing the pump or picking up the water. It is a common occurrence for a pump to refuse to lift the water when the discharge valves are held down to the seat by the pressure of the water in the discharge pipe. This results in the pump becoming "air bound," as the air is unable to escape from the pump, but is merely compressed in the pump chamber. The purpose of a check valve in the suction pipe is to retain water in the pump and suction pipe so that in starting the pump will not have to free itself of air. This is especially essential where the suction line is very long or where there is a high lift.

As a general rule a check valve on the discharge line of a pump should be placed as near the pump as possible. If a check valve is used on the suction line the opposite is the case; that is, the check valve should be placed as far from the pump and as near the source of supply as possible.

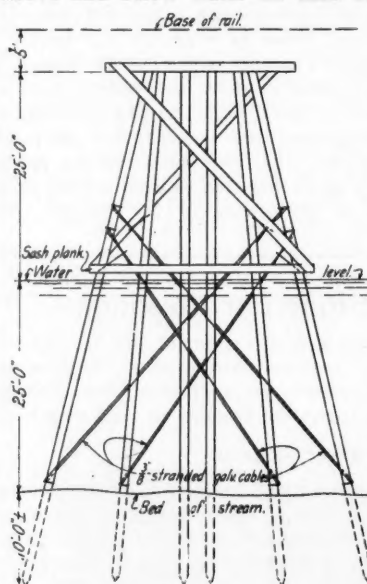
C. R. KNOWLES,

Superintendent of Water Service, Illinois Central, Chicago, Ill.

## Bracing Trestle Bents in Deep Water

*Another answer to a question covered in last month's issue.*

The Louisville division bridge forces of the Pennsylvania System successfully solved a problem of bracing falsework under water at Bridge No. 185 on the Madison branch in 1915. The sketch shows the bracing used above and below water on each of the bents.



How the Bents Were Braced

the derrick car and making them fast above water to the opposite side of the bent. The cables were again tightened with a hand spike used as a twister. The trestle thus built was very secure and carried traffic about five months and withstood a flow of ice and drift in the spring before it was dismantled.

D. B. JOHNSTON,

Division Engineer, Pennsylvania System, Louisville, Ky.

**GASOLINE-OPERATED PASSENGER CARS.**—The Northern Pacific is now operating a gasoline-operated rail car in regular service on a branch line between St. Paul and White Bear, a distance of about 12 miles. This car has accommodations for 17 passengers and a baggage department and has been found to operate at a cost much lower than steam-operated equipment for this kind of service.

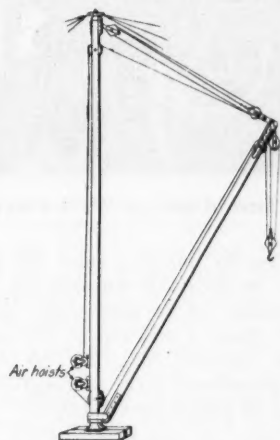


# NEW DEVICES



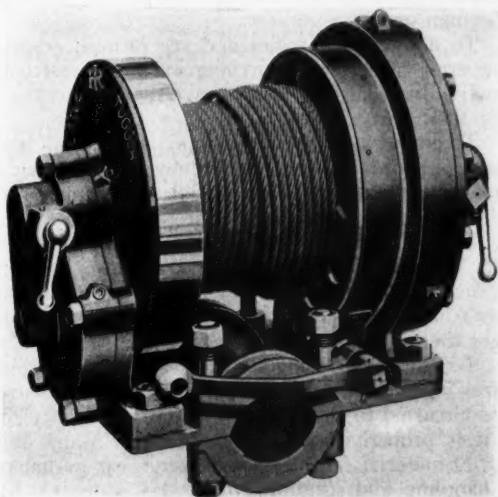
## An Air Operated Guy Derrick

THE USE of compressed air for the operation of a derrick is illustrated in the diagram below, which shows how two "Little Tugger" hoists, manufactured by the Ingersoll-Rand Company, were attached to the mast



A Derrick Equipped With Air Hoists

and rigged so that one of them handled the boom line and the other the fall line. This arrangement can be applied to derricks in the place of hand crabs wherever compressed air service is available and comprises a new use

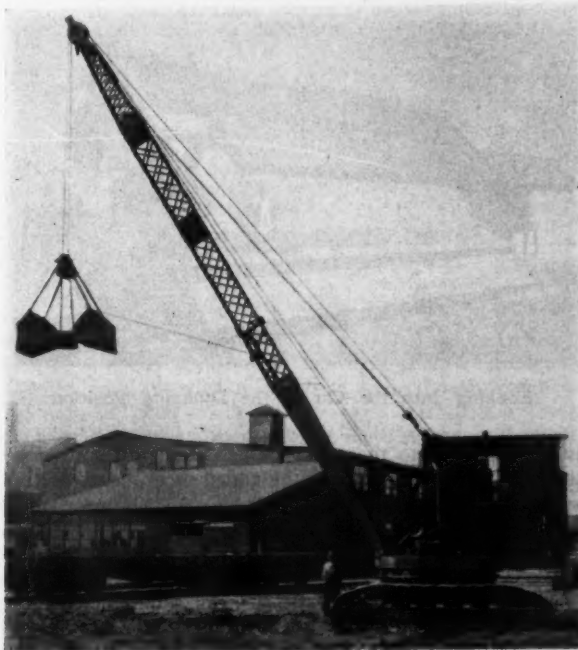


The Little Tugger Hoist

of this form of hoist, which is also applicable to railroad work in the case of small hoists or derricks mounted on cars for loading material, as a facility for shifting cars, for the handling of heavy timbers, etc. As shown in the photograph, the "Little Tugger" comprises a hoisting drum operated by an air motor and equipped with a brake and with suitable control levers for each. The hoist is available in two sizes, one weighing 285 lbs., designed for  $\frac{1}{4}$ -in. and  $\frac{5}{16}$ -in. cable with a rope speed of 85 ft. per min., capable of handling 1,000 lb. with air at 80 lb. pressure, while the other weighs 350 lb. and is designed for the use of  $\frac{7}{8}$ -in. rope.

## A Gasoline-Operated Locomotive Crane

MAINTENANCE officers associated with work involving the use of power equipment for the handling of earth, loose rock, rail and similar material, either on or off the tracks, will be interested in a gasoline-operated



Orton & Steinbrenner Gasoline-Operated Crane

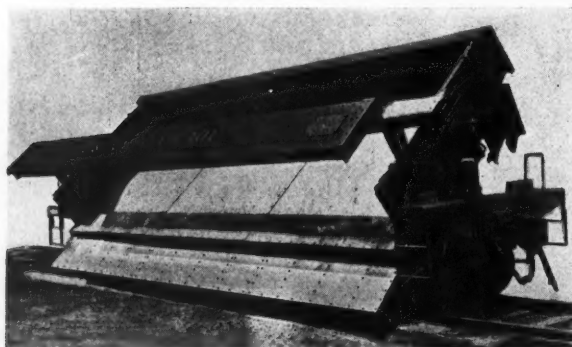
locomotive crane recently developed by the Orton & Steinbrenner Company, Chicago. This crane is a caterpillar tread type machine of similar construction to the machine described in the issue of the *Railway Main-*

*tenance Engineer* for May, 1921, with the exception that gasoline power is used in the place of steam. This power is obtained by a 55 hp. four-cylinder Climax tractor type engine which is installed parallel to the side of the crane and placed on the opposite side of the cab from the operator. The engine is enclosed in a special casing and a 60 gal. gasoline tank with gravity feed is placed outside of the cab at the rear, the latter arrangement eliminating as much as possible any danger of fire. Transmission of power is effected by means of cut steel bevel gears, cased, these gears being engaged through the medium of a multiple disc type clutch.

Points which are advanced in favor of this type of machine are that it is always ready for instant use, requires no licensed engineer for its operation nor an extra man, as is sometimes required in the case of steam outfits, that it is particularly well adapted for intermittent service and does not entail the dirty work or discomforts often attending the use of coal burning units. The power used is especially designed for use on the 7 and 12 ton crawling treads and road wheel cranes, but can be readily installed on standard or special gage rail cranes of larger capacity. When desired for purposes of operating an electric magnet the equipment accommodates the installation of a belt-driven generating set.

### An Improvement in Air Dump Cars

**T**HE KILBOURNE & Jacobs Company, Columbus, Ohio, has recently devised an apron attachment for its all-steel air dump cars which comprises a distinct advancement in this type of equipment. The purpose of these aprons is to insure that the materials dumped from the cars will be disposed of at a sufficient distance from the rail to prevent fouling the ballast and avoid the expenditure of any labor for clearing the track after the dumping has been completed. This apron attachment



Looking Into the Car in the Dumping Position

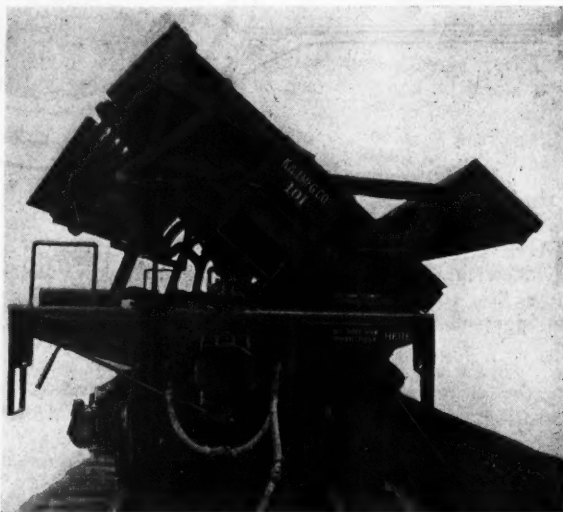
is now applied to the new equipment manufactured by that company, but may also be added to any cars of that make now in service.

This apron attachment is in effect a 28-in. extension of the car floor on both sides, pivotally connected in such a manner as to take a position in a plane practically parallel to the floor when the car is in the dumping position. As the car is dumped the apron on the low side is moved outward automatically and when the car is again righted the apron is restored to the vertical position. The aprons on the two sides of the car are entirely independent of each other.

The movement of the apron takes place with the dumping of the car itself, which is actuated by compressed air drawn from a reservoir mounted on the car. The

air used is supplied from a regular brake train line, passing through a check valve which separates the brake pipe from the storage reservoir.

The operation of the car when dumping is controlled by a hand lever which admits air from the reservoir into one of two vertical cylinders 20 in. in diameter, situated on each side of the car. The cylinder is brought into play on the side opposite to that on which the load is to be dumped and the car is righted again by the operation



End View of the Car While Dumping

of the cylinder on the dumping side. By connecting the auxiliary valves on each side through the medium of an air line, any number of the connected cars may be operated as a unit from a position at the operating levers of any car in the connected unit. The use of cars equipped with the apron attachment have thoroughly demonstrated the effectiveness of this improvement.

### The Four Most Important Duties of a Section Foreman\*

By J. W. RALEY

Section Foreman, Southern Pacific Lines, Cuero, Texas

**I**N MY OPINION the four most important duties of a foreman are:

1. To abide by the rules and regulations, respecting his superior officers and carrying out their instructions willingly. In doing this he will give the best service and satisfaction.
2. To know at all times that his track and bridges are safe, or properly protected, thereby insuring the movement of trains with the least possible delay and preventing the loss of life or damage to property.
3. To manage his work so as to accomplish the best results without waste of time and expense, impressing upon his men the importance of doing a job well, so that it won't have to be done again on account of not doing it right the first time.
4. To economize, using all serviceable material, instead of throwing it away or sending it in as junk. This material is intrusted to the foreman and it is his duty to see that it is properly used and cared for. Many dollars' worth of material can be wasted every year by not properly handling and installing it.

\*From the October Bulletin of the Southern Pacific Lines.

# Railroads Announce Premium Awards

## Names of Supervisors and Foremen Who were Granted Prizes for Excellence in Track Maintenance

**F**OLLOWING the annual fall track inspections a number of railroads have announced the award of prizes to track foremen and supervisory officers for the highest ratings on the conditions of their tracks. The manner of granting these awards, the character of the prizes given and the methods of rating are not the same on any two roads. Nevertheless, the object is the same and the results secured are of general interest to all track men. Reports given out by the various railroads following this practice are given below:

### Pennsylvania Results

The awards on the Eastern region were made on the basis of the results evidenced from the regular monthly inspections as has been the custom in the past, although for 1921 no regular annual inspection was made by train. The premiums for the best line and surface on the main line between New York and Altoona, Pa., and between Philadelphia and Washington, amounting to \$800 for the supervisor and \$400 for the assistant, were awarded to H. H. Kaufman, supervisor, and J. B. Otto, Jr., assistant supervisor at Middletown, Pa. Premiums of \$700 and \$300 for the greatest improvement in line and surface were awarded to E. L. Koch, supervisor, and E. L. Smith, assistant supervisor at Lamokin, Pa. Three other prizes each consisting of \$600 for the supervisor and \$200 for the assistant supervisor for the best line and surface on the New York division, the Middle division and the Baltimore division were awarded to L. J. Fairbank, supervisor, and C. W. Van Nort, assistant supervisor, at New Brunswick, N. J.; C. S. Hager, supervisor, and J. J. Caldwell, assistant supervisor, at Newport, Pa., and R. W. E. Bowler, supervisor, and E. R. Parke, assistant supervisor, at Washington, D. C.

The awards for the Central region were also based on the results of periodical inspections made throughout the year. The prize, consisting of \$1,200, for maintaining the best line and surface in the Central region, was awarded to sub-division No. 12, Pittsburgh division, W. S. Johns, Jr., supervisor, receiving \$800 and P. X. Geary, assistant supervisor, receiving \$400. The prize for maintaining the best line and surface on the Eastern and Panhandle divisions, consisting of two awards of \$600 each, were given to C. W. Myers, supervisor, sub-division No. 4, Eastern division, and S. H. Kuhn, supervisor, sub-division No. 2, Panhandle division.

In the Northwestern region first, second and third prizes were awarded to the supervisors and a prize of \$50 to the track foreman having the best section on each supervisor's sub-division. The awards were as follows:

#### SUPERVISORS' PRIZES.

First prize \$250, C. McCarthy, supervisor "A," Logansport division.

Second prize \$200, J. Butoon, supervisor "D," Logansport division.

Third prize \$150, C. M. Light, supervisor 6, Fort Wayne division.

#### FOREMAN'S PRIZE, \$50.

John Richardi, Chicago Terminal division.

Frank Alvira, Chicago Terminal division.

A. J. Anoskey, Logansport division.

D. C. Donner, Logansport division.

J. N. Suggestin, Logansport division.

P. S. Crawford, Logansport division.

C. F. Huffman, Fort Wayne division.

William Goddard, Fort Wayne division.

E. E. Brown, Fort Wayne division.  
H. Marquart, Fort Wayne division.  
E. O. Berg, Fort Wayne division.  
J. E. Whitesell, Fort Wayne division.  
I. N. Wright, Grand Rapids division.  
E. Henson, Grand Rapids division.  
C. R. Watson, Mackinaw division.  
J. C. Affles, Mackinaw division.  
A. Grumelot, Mackinaw division.  
E. Stinebaugh, Toledo division.  
A. G. Hammerschmidt, Toledo division.  
I. F. Butts, Toledo division.

On the Southwestern region, the regular general managers' annual track inspection was held and prizes awarded to supervisors and foremen. The awards are as follows:

#### SUPERVISORS' PRIZES.

First prize \$200, M. E. Boyle, supervisor No. 3, St. Louis division.

Second prize \$150, B. J. Boyle, supervisor No. 2, St. Louis division.

Third prize \$100, J. A. Garrettson, supervisor No. 1, Louisville division.

#### AWARDS TO TRACK FOREMAN \$50.

Prospero Lanave, Columbus division.  
F. Reiley, Columbus division.  
David Hogston, Columbus division.  
W. Jackson, Columbus division.  
Charles McElfresh, Cincinnati division.  
Frank Steiger, Cincinnati division.  
E. F. Rutherford, Cincinnati division.  
Thomas Maloney, Cincinnati division.  
G. Iacune, Richmond division.  
B. Stall, Richmond division.  
William Grubaugh, St. Louis division.  
William Creger, St. Louis division.  
Frederick Loyet, St. Louis division.  
George Croft, Louisville division.  
E. G. Lewis, Louisville division.  
Michael Cooning, Louisville division.  
Walter Vaught, South Bend division.  
G. Jones, South Bend division.  
D. Mathewman, South Bend division.  
O. A. Waters, Indianapolis division.  
Homer Pryor, Indianapolis division.  
Brose Clark, Indianapolis division.  
G. O. Hood, Zanesville division.  
William Bartels, Zanesville division.  
W. G. Sinclair, Peoria division.  
G. W. Lucas, C. L. & N. Ry. division.

### Awards on the Canadian Pacific, Eastern Lines

The general manager's prize of \$100 for the best section in all divisions of the Eastern lines of the Canadian Pacific, was awarded to H. Benoit, section foreman on Section 19, Sherbrooke sub-division, Farnham division, Quebec district. Other awards included general superintendents' prizes of \$50 awarded to the best section in each district, superintendents' prizes of \$25 for the best section in each division and roadmasters' prizes of \$10 for the best section in each roadmasters' sub-division. The awards by district are as follows:

#### NEW BRUNSWICK DISTRICT.

General superintendent's prize, \$50, to F. Dickinson; Browns-ville division—superintendent's prize, \$25, to F. Ferland, and roadmasters' prizes, \$10, to F. C. Tracey, W. Gamble, W. E. Nason and P. Nadeau. Woodstock division—superintendent's prize, \$25, to A. McLaughlin, and roadmasters' prizes, \$10, to S. R. McCrum, E. A. King and A. Peluso.

#### QUEBEC DISTRICT.

General superintendent's prize, \$50, to A. Giroux; Farnham division—superintendent's prize, \$25, to P. W. Delaire, and road-



masters' prizes, \$10, to A. Bourdeau, F. Gadley, Joseph Partridge and E. Jacques.

Montreal Terminals division—superintendent's prize, \$25, to A. Duranceau, and roadmaster's prize, \$10, to G. Clement.

Laurentian division—superintendent's prize, \$25, to V. Carpentier, and roadmasters' prizes, \$10, to C. Denoncourt, A. Morin, J. McLeod and A. Pelland.

Ottawa division—superintendent's prize, \$25, to M. Gauthier, and roadmasters' prizes, \$10, to E. Boileau, N. Huno and A. Robillard.

Smith Falls division—superintendent's prize, \$25, to C. Burgess, and roadmasters' prizes, \$10, to H. Foster, A. Rozon and A. Weisenburg.

#### ONTARIO DISTRICT.

General superintendent's prize, \$50, to D. Parsons; Trenton division—superintendent's prize, \$25, to J. Dowdell, and roadmasters' prizes, \$10, to G. Dowall, T. Wilson, H. Roberts, C. McCullough, J. Wickens, and E. Osborne.

London division—superintendent's prize, \$50, to T. Rath, and roadmasters' prizes, \$10, to A. Fairbanks, X. Mathies, F. H. Plain and J. Cox.

Bruce division—superintendent's prize, \$25, to H. Richards, and roadmasters' prizes, \$10, to W. Bell, J. Telford and J. Hiscox.

Toronto Terminals division—superintendent's prize, \$25, to F. Tuckley, and roadmaster's prize, \$10, to Mr. Powell.

#### ALGOMA DISTRICT.

General superintendent's prize, \$50, to A. Cannon; Sudbury division—superintendent's prize, \$25, to J. Whyatt, and roadmasters' prizes, \$10, to S. McCarthy, G. Greenacre, P. Caico, J. Penfold and J. Sayers.

Chapleau division—superintendent's prize, \$25, to E. Pearson, and roadmasters' prizes, \$10, to S. Danyluk and A. Nuttika.

Schreiber division—superintendent's prize, \$25, to J. Michaud, and roadmasters' prizes, \$10, to Z. Ogvodnik and B. Michaud.

### Motor Cars Given on the Southern Railway, Lines East

The awards of the Southern Railway for the best sections differ somewhat from those usually given on most railroads. For 1920 the management offered a prize of a section motor car for the best section on each supervisor's territory. As a number of sections were already equipped with motor cars, a prize of \$20 in gold was given wherever such a case occurred and the motor car passed on to the next best section. Where that section already had a car, the prize was given to the third best and the foreman of the second awarded \$10 in gold.

The foremen whose sections are to be awarded motor cars for results obtained during the past year are as follows. Names marked thus (\*) are on sections rated second or third best.

Washington division: William McCain,\* W. M. Gray, Edward Norvil and J. Hawk.\*

Danville division: J. T. Dudley, W. G. Melton, L. B. Sheridan,\* D. C. McCowan,\* E. R. Williams\* and J. S. Jones.

Richmond division: A. R. Hendrix,\* L. B. Cook\* and J. T. Knight.\*

Norfolk division: Otis Ramsay\* and J. D. Pittard.\*

Winston-Salem division: J. W. Bostian, E. A. Pleasants and R. A. Staley.

Atlantic and Yadkin Railway: J. H. Lawson.

Charlotte division, north end: H. T. McCarn, R. L. Pinkerton and J. H. Mullins.

Charlotte division, south end: J. A. Lawrence, W. R. Eades and E. C. Browning.

Columbia division: H. G. Walker, C. F. Pope\* and C. W. Moody.

Spartanburg division: C. S. Moore,\* W. L. Fuller and J. F. Saylor.

Charleston division: D. C. Reynolds, Jacob Walters, James Ray and W. L. Bowers.\*

Asheville division: E. C. Perkins,\* W. O. Lippard, S. J. Jarrett and A. H. Mehaffey.

Knoxville division: W. B. Austin, T. G. Shell, J. F. Hux, H. Hall and G. W. Warren.

Coster division: W. M. Baker, N. B. Scott and G. W. Sharpe.

Appalachia division: E. A. Lane, L. A. McShee and J. R. Midkiff.\*

The names of foremen who will receive \$20 in gold as a prize for the best results obtained during the year

because their sections were already equipped with motor cars are as follows:

Washington division: J. R. Jones and J. E. Murphy.

Danville division: R. S. Cooper, O. E. Hassell and S. H. Pillow.

Richmond division: W. H. Walker, P. S. Blankenship and J. H. Daniel.

Norfolk division: W. R. Bray and G. W. Conwell.

Charlotte division, south end: A. C. Walker.

Columbia division: J. F. McGee and D. L. Matthews.

Spartanburg division: T. L. Burrell.

Charleston division: C. M. Mauney.

Asheville division: J. R. Perkins.

Appalachia division: W. D. Parris.

The foremen who are to be given \$10 in gold because their sections were awarded second place are as follows:

Washington division: W. B. Holmes.

Danville division: J. T. Daniel and Ray Davis.

Richmond division: J. W. Dean.

Norfolk division: Will Long and C. A. Gill.

Columbia division: T. D. Moore and C. M. Rhodes.

### The Richmond, Fredericksburg & Potomac

The methods of awarding prizes on the Richmond, Fredericksburg & Potomac were changed for 1921 and a plan adopted whereby eight prizes were awarded. Four were given on the basis of the marking of the judges for the excellence of the track and four others were awarded on the marking of the judges with the cost per mile for maintenance taken into consideration. It will be noted that two sections each received two prizes.

#### PRIZES ON MARKING OF JUDGES ALONE.

\$100—J. W. Blanton, Summit, Va.

\$80—W. A. Young, Milford, Va.

\$60—J. S. Carpenter, Fredericksburg, Va.

\$10—W. H. Sisson, Alexandria, Va.

#### PRIZES WITH COST CONSIDERED.

\$100—W. W. Lowry, Elmont, Va.

\$80—J. S. Carpenter, Fredericksburg, Va.

\$60—C. F. Watson, Laurel, Va.

\$40—W. A. Young, Milford, Va.

### The Lehigh Valley Awards

The annual inspection of the Lehigh Valley was conducted along its usual lines, the grading of the judges being based upon a system which separates the track and roadbed into the following percentages: Surface and line, each 35 per cent; ties, ballast, drainage and general appearance, each six per cent, and anti-creepers, insulated joints, bolts, etc., taken as a whole, six per cent. The general level of the results in percentages shows a slightly higher level than for 1920 and also indicates a considerable degree of uniformity for the track structure of the entire road.

The New York division, A. M. King, division engineer, received the highest rating with a percentage of 98.15 with the Seneca division, G. A. Phillips, division engineer, and the New Jersey and Lehigh division, J. F. Donovan, division engineer, second and third with ratings of 98.01 and 97.76, respectively. The remaining two main line divisions had ratings of 97.09 and 97.07.

The ratings of the supervisors' sub-divisions were as follows:

P. M. Dinan, Seneca division .....	98.63
J. Sheehan, New York division .....	98.15
J. A. Murphy, Seneca, division .....	97.99
Edw. Dinan, N. J. & L. division .....	97.94
R. Cunningham, N. J. & L. division .....	97.78
C. Hewitt, Seneca division .....	97.70
A. B. Shimer, N. J. & L. division .....	97.64
H. F. Reilly, Wyoming division .....	97.51
J. F. Camp, Seneca division .....	97.39
W. F. Nichols, Buffalo division .....	97.32
M. J. Murphy, Wyoming division .....	96.93
B. F. McGuire, Buffalo division .....	96.88

The highest rating awarded any one section was that given section No. 65, which was also high for 1920, the

rating being 99.73. Section No. 64 was a close second with 99.59. The lowest rating for any section was 96.04.

#### Pere Marquette Results

Following the annual track inspection on the Pere Marquette, a prize of \$100 was awarded to William Meier, track supervisor on the Detroit division at Grand Ledge, Mich., for the highest rating as to condition of track on a supervisor's subdivision. An equal sum was given to E. Anderson, track supervisor on the Ludington division, with headquarters at Saginaw, Mich., in recognition of the greatest improvement in the condition of a subdivision as compared with last year.

Prizes of \$25 each were awarded to one section foreman on each supervisor's subdivision for the best grading for general conditions of the section. The names of these section foremen are as follows:

Name	Section Headquarters
William Krajewski	Wyoming
Dell Dunham	Sawyer
Fred Schnase	Grand Haven
Edward A. Gustafson	White Cloud
Leonard Garnett	Grawn
George Newsome	Fowlerville
William Francis	Shedden
Edward Wehner	Steiner
Tony Accord	Bridgeport
Herman Kumbier	Mershon
Fred Fuller	Amadore
Jess Ellison	Akron
William Chudley	Mecosta

Prizes of \$25 were also awarded to one section foreman on each track supervisor's subdivision for making the greatest improvement of the track under his charge as compared with last year. These foremen are listed below:

Name	Section Headquarters
Charles Young	LaPorte
Lafayette Briggs	Muskegon Heights
Carl Robart	Bitely
Criss Smith	Alden
Frank Jaszewski	Howell
C. Leavack	McGregor
Joseph Mentel	Erie (North)
Julian Hunt	Clare
Hugh Leitch	Port Austin
Reuben Deiner	Gera
Warner Spencer	Lowell

#### Results Reported on the Long Island Railroad

The Long Island Railroad awarded three supervisors' prizes, consisting of a first prize of \$200, a second prize of \$100 for the best line and surface and a special prize of \$100 for the greatest improvement. F. J. Rehroff, supervisor of Division No. 4, and W. M. Steers, supervisor of Division No. 5, won the first and second prizes. C. F. Dunbar, supervisor of Division No. 1, won the special prize for improvement.

A first prize of \$100 and a second prize of \$50 was also given the two section foremen on each division for best line and surface. The awards were as follows:

John Demeola, Division 1, \$100.
Carmine Yannucci, Division 1, \$50.
John Rozzano, Division 2, \$100.
Steve Uliano, Division 2, \$50.
Frank Maricio, Division 3, \$100.
Casimo M. Giraldo, Division 3, \$50.
Martin Conway, Division 4, \$100.
W. S. Jenkins, Division 4, \$50.
Jacob Reichert, Division 5, \$100.
Angelo Martino, Division 5, \$50.

**WAR TAXES LOOM LARGE.**—A million dollars a month, approximately, is the amount of war taxes which the New York Central has been collecting for the government the past four years on passenger tickets and freight bills.

## Novel Culvert Construction

**R**AILROAD culverts are, as a rule, constructed under existing tracks by two general methods, which consist of excavating and of tunneling. A departure from these methods was recently carried out on the Pennsylvania Railroad near Maurer, N. J., without interruption to traffic or the use of any slow orders. In this work two 20-ft. cylinders made of  $\frac{3}{8}$ -in. boiler plate, each 6 ft. 6 in. in diameter, were jacked through the embankment beneath the double track line, thus taking the place of the usual excavating and cribbing operations.

In carrying out this construction a working space was first excavated at one side of the tracks, sufficiently large to allow the first cylinder or shell to be placed in position for jacking. Four 35-ton, worm-gear drive jacks, manufactured by the McKiernan-Terry Drill Company, New York, were used. A U-shaped frame built up from 12-in. by 12-in. timbers joined with tie plates was installed as a bearing surface for three of the four jacks.

The bearing provided to rest against the back of the excavation opposite the shell consisted of 4-in. yellow



Jacking the Shield Into the Embankment

pine vertical sheeting with three lines of 12-in. by 12-in. timbers placed horizontally on either side of it. Work was advanced 10 in. at a time, that being the full extension of the jacks, after which the length of the jacking timbers was increased and the performance repeated. The upper part of the shell was jacked through stiff clay and hardpan and the lower part through quicksand. The average progress was about  $3\frac{1}{2}$  lin. ft. in a 9-hr. day. It was estimated that there was a load of about 50 tons on each of the jacks during the work. The top of the shell was kept about four feet below the top of rail, and the arch of the shell was found to be sufficiently strong to support the passage of the heaviest trains. After the jacking through was completed the interior of the shell was excavated and 48 in. by 52½ in. Massey concrete pipe was installed and the space between the pipe and the shell filled with grout.

The work was done by Arnolt-More, Inc., Newark, N. J., under the supervision of F. M. Arnolt, who, with J. G. Forsman, inspector, developed the underlying idea.



### American Railway Engineering Association

The Nominating Committee presented its report to the board of direction at its meeting in New York in November as follows: For president, J. L. Campbell, chief engineer, El Paso & Southwestern, El Paso, Tex.; for second vice-president, G. J. Ray, chief engineer, Delaware, Lackawanna & Western, Hoboken, N. J.; for director (three to be elected), D. J. Brumley, chief engineer, Chicago Terminal Improvements, Illinois Central, Chicago; Maurice Coburn, engineer maintenance of way, Pennsylvania System, Indianapolis, Ind.; H. T. Douglas, Jr., chief engineer, Chicago & Alton, Chicago; F. W. Green, vice-president, St. Louis-Southwestern, St. Louis, Mo.; C. E. Lindsay, special engineer, New York Central Lines, Albany, N. Y.; J. C. Mock, signal-electrical engineer, Michigan Central, Detroit, Mich.; H. L. Ripley, valuation engineer, New York, New Haven & Hartford, Boston, Mass.; O. E. Selby, principal assistant engineer, Cleveland, Cincinnati, Chicago & St. Louis, Cincinnati, Ohio; and W. P. Wiltsee, principal assistant engineer, Norfolk & Western, Roanoke, Va. For nominating committee (five to be elected), W. J. Backes, engineer, maintenance of way, New York, New Haven & Hartford, New Haven, Conn.; A. M. Burt, assistant to vice-president in charge of operation, Northern Pacific, St. Paul, Minn.; J. V. Hanna, chief engineer, Kansas City Terminal railroad, Kansas City, Mo.; Maro Johnson, assistant engineer, Illinois Central, Chicago; H. K. Lowry, signal engineer, Chicago, Rock Island & Pacific, Chicago; J. de N. Macomb, office engineer, Atchison, Topeka & Santa Fe, Chicago; A. Montzheimer, chief engineer, Elgin, Joliet & Eastern, Joliet, Ill.; W. L. Morse, special assistant engineer, New York Central, New York; P. B. Motley, engineer bridges, Canadian Pacific, Montreal, Can., and A. O. Ridgway, assistant chief engineer, Denver & Rio Grande Western, Denver, Colo.

Twelve reports are already completed ready for publication and in the hands of the secretary. These reports are more voluminous than usual, indicating special activity on the part of the committees during the past year. Among the reports which have been completed are those of the committees on Yards and Terminals; Ballast; Electricity; Shops and Locomotive Terminals; Iron and Steel Structures; Signs, Fences and Crossings; Ties; Masonry; Track; Signals and Interlocking; Roadway and Standardization. It is planned to publish the reports in eight bulletins, the first of which, containing three reports, will go into the mail within a few days.

### American Wood Preservers' Association

Arrangements are now complete for the convention of the American Wood Preservers' Association, which will be held at the Hotel Sherman, Chicago, on January 24-26, inclusive. On the Wednesday evening of the convention week a joint meeting will be held with the Western Society of Engineers in the rooms of the latter in the Monadnock Block, at which a paper will be presented by A. F. Robinson, bridge engineer of the Santa Fe System, on the use of creosoted timber in bridges on the

Atchison, Topeka & Santa Fe. The program of the Wood Preservers' convention is as follows:

TUESDAY, JANUARY 24

10:30 A. M.

Invocation, address of welcome and opening business.  
Effect of Heat on Wood-Destroying Fungi in Mills, by Dr. Walter H. Snell.

2 P. M.

Committee report on Preservatives, A. L. Kammerer, chairman.  
A Theory on the Mechanism of the Protection of Wood by Preservatives, by Ernest Bateman, chemist, Forest Products Laboratory, Madison, Wis.

Committee report on Utilization and Service: Economics, Kurt C. Barth, chairman; Track, S. D. Cooper, chairman; Flooring and Paving, L. T. Ericson, chairman.

What Constitutes Reliable Service Records, by M. F. Deutsch, statistician, Forest Products Laboratory, Madison, Wis.

The Economics of Cross-Tie Renewals, by V. K. Hendricks, Terre Haute, Ind.

Factors Affecting the Cost of Treated Cross-Ties, by E. E. Pershall, vice-president T. J. Moss Tie Company, St. Louis, Mo.

Photography and Wood Preservation, by Henri Strawn, photographer, Atchison, Topeka & Santa Fe, Topeka, Kan.

WEDNESDAY, JANUARY 25

10 A. M.

Feasibility of Using Tropical Hardwoods for Railroad Ties in This Country, by Nelson C. Brown, American Woods Export Association, New York.

Committee Report on Treatments: Ties—Fir, R. H. Rawson, chairman; Lumber—Car, W. J. Smith, chairman; Treated Car Sills and Decking, F. S. Shinn; Poles—Pressure and Non-Pressure Treatments, R. F. Hosford, general chairman; Wood Pipe, H. E. Horrocks, chairman; Creosoted Wood Stave Pipe, H. D. Coale, chairman; Inspection, J. R. Keig, chairman.

Should the Increased Cost of Treating Ties Be Charged to Maintenance or Capital Account? by Earl Stimson, chief engineer of maintenance, Baltimore & Ohio, Baltimore, Md.

Lumber Drying by Vacuum, by O. E. Jacobs.

2 P. M.

Growing Need for Preservation of Mine Timbers, by R. R. Hornor.

Why Preserve Mine Timbers? by George M. Hunt, chemist Forest Products Laboratory, Madison, Wis.

Decay of Timber in Mines, by C. J. Humphrey, pathologist, Bureau of Plant Industry, Madison, Wis.

Committee report on Plant Operation: Peeling Ties, F. S. Pooler, chairman; Adzing, Boring and Perforating Layouts, D. W. Edwards, chairman; Car Loading, A. E. Larkin, chairman; Insurance, W. E. Doan, chairman; Pressure Machinery, E. E. Alexander, chairman; Material, Handling, A. H. Onstad, chairman.

THURSDAY, JANUARY 26

10 A. M.

Committee report on San Francisco Bay Marine Piling, F. D. Mattos, chairman.

Committee report on Gulf Coast Marine Piling Survey, E. E. Boehne, chairman.

American Shipworms, by Paul Bartsch.

Closing business.

### Tie Producers' Association

The National Association of Railroad Tie Producers will hold its fourth annual convention at the Hotel Sherman, Chicago, on January 26 and 27. The first day will be devoted to the consideration of comprehensive reports of conditions in the various tie-producing regions. On the following day papers will be presented by Frederickson Dunlap, professor of forestry, University of Missouri, on "Practical Reforestation in the Ozark Region"; by Walter G. Hougland, Evansville, Ind., on "Trials and Tribulations of a Tow Boat Operator"; by George Loff, Standard Tie Company, Evanston, Wyo., on "Tie Driving in the Wyoming Mountains"; by Timmons Harmount of the Harmount Tie & Lumber Company, on the "History of the Tie Producers' Association," and by a representative of the Forest Products Laboratory on "The Shrinkage of Ties in Seasoning."



### Bridge and Building Association

The work of the Bridge and Building Association is now well under way and is at least six weeks ahead of the schedules of former years. Acknowledgment of appointment for committee work has been received from over 80 per cent of those selected for this service. The committees are showing unusual interest in their work. The chairman of one committee sent 100 letters to members of the association within ten days of the receipt of his appointment as chairman. It is the intention to have all reports completed and in the hands of the secretary for publication not later than August 1.

### Roadmasters' Association

Committees representing the Roadmasters' and Maintenance of Way Association and the Track Supply Association met in Cleveland recently and after careful investigation of the hotel facilities of this city, selected the Hotel Statler for the headquarters during the 1922 convention, which will be held on September 19-21, inclusive. The personnel of all of the committees has now been completed and the members are actively engaged in securing data for incorporation in their reports.

### Maintenance of Way Club of Chicago

The third regular meeting of the Maintenance of Way Club of Chicago was held at the Auditorium Hotel on December 14. Following a get-together dinner, a paper was presented by J. S. Robinson, division engineer, Chicago & North Western, on the relation of the weight of cars and locomotives to the weight of rail. A lively discussion followed, which hinged largely on the experience with transverse fissures and the methods of overcoming difficulties with light rail in yards.

### International Track Supervisors' Club

The regular December meeting was held at the Fort Pitt Hotel, Pittsburgh, Pa., on December 17, with 27 members present. This location was selected in accordance with the policy of the club to visit factories at which maintenance of way materials and equipment are manufactured from time to time in order that the members may gain first-hand knowledge of the production of the materials which they are using. At this meeting the club visited the plant of the Verona Tool Works, Verona, Pa., where the members were afforded an opportunity to witness the testing of the metals used in the tools, and then to observe the various steps leading up to the finished product.

After completing the inspection, the members convened for a discussion of the paper presented before the Maintenance of Way Club of Chicago on October 26 by J. J. Navin, and published in the *Railway Maintenance Engineer* for November.

### MAINTENANCE OF WAY CONVENTIONS

American Railway Bridge and Building Association, C. A. Lichty, secretary, C. & N. W., Chicago. Next annual convention, Cincinnati, October 17-19, 1922. Simultaneous exhibit by Bridge and Building Supply Men's Association, D. J. Higgins, secretary, American Valve and Meter Company, Chicago.

American Railway Engineering Association, E. H. Fritch, secretary, 431 South Dearborn street, Chicago. Next annual convention, Congress Hotel, Chicago, March 14-16, 1922. Simultaneous exhibit by the National Railway Appliances Association at the Coliseum, C. W. Kelly, secretary, Kelly-Derby Company, Chicago.

American Wood Preservers' Association, G. W. Hunt, secretary, Box 375, Madison, Wis. Next annual convention, Hotel Sherman, Chicago, January 24-26, 1922.

National Association of Railway Tie Producers, Warren C. Nixon, Western Tie & Timber Company, 905 Syndicate Trust building, St. Louis, Mo. Next annual meeting at Chicago, Hotel Sherman, on January 26-27, 1922.

Roadmasters' and Maintenance of Way Association of America, P. J. McAndrews, secretary, C. & N. W., Sterling, Ill. Next an-

nual convention, Cleveland, Ohio, September 19-21, 1922. Simultaneous exhibit by the Track Supply Association, W. C. Kidd, secretary, Ramapo Iron Works, Hillburn, N. Y.

Maintenance of Way Master Painters' Association of the United States and Canada, E. E. Martin, secretary, Room 19, Union Pacific Building, Kansas City, Mo. Next annual convention, Buffalo, N. Y., October 3-5, 1922.

Metropolitan Track Supervisors' Club, S. A. Hart, secretary-treasurer, supervisor Pennsylvania Railroad, Mount Holly, N. J. Periodic meetings in New York City.

International Track Supervisors' Club, A. M. Clough, secretary, supervisor New York Central, Batavia, N. Y. Periodic meetings at Buffalo, N. Y.

Maintenance of Way Club of Chicago, W. S. Lacher, secretary, *Railway Maintenance Engineer*, Chicago. Evening meetings at the Auditorium Hotel on February 15, April 19, June 21 and August 16, 1922.

## The Material Market

THE MARKET for iron and steel products is exceedingly quiet. While the railroads continue to be a most important factor, there has been a general tendency to withhold purchases because the buyers are waiting to see what transpires with the turn of the year and with possible reductions in freight rates. However, in the face of this very quiet market, only minor changes have taken place in price. On the other hand, there has been an increasing tendency to disregard the Pittsburgh base, prices being quoted more and more f. o. b. mill instead of naming the prices at Pittsburgh plus freight. Prices of tie plates have been shaded slightly and the base for wire and wire products is now definitely recognized at the lower figures prevailing before the advance announced in September.

	Prices in Cents Per Pound			
	November 20	December 15	Pittsburgh	Chicago
Track spikes	2.25	2.63	2.25	2.38 to 2.63
Track bolts	3.25	3.63	3.25	3.38 to 3.63
Angle bars	2.40	2.40	2.40	2.40
Tie plates, steel	2.00	2.00	2.00	1.90 to 2.00
Tie plates, iron	2.00	2.00	2.00	1.90 to 2.00
Plain wire	2.60	2.98	2.50	2.88
Wire nails	2.90	3.28	2.75	3.13
Barbed wire, gal.	3.55	3.93	3.40	3.78
C. I. pipe, 6 in. or larger, per ton	44.10	44.10		44.10
Plates	1.55	1.75	1.50 to 1.60	1.60 to 1.75
Shapes	1.55	1.75	1.50 to 1.60	1.60 to 1.75
Bars	1.50	1.65	1.50	1.60 to 1.75

The scrap market shows a perceptible drop from a month ago, prices being from \$1 to \$2.50 lower.

	Prices Per Gross Ton at Chicago	
	November 20	December 15
Relaying rails	\$25.00 to \$30.00	\$23.00 to \$27.50
Rolling rails	14.00 to 14.50	12.50 to 13.00
Rails less than 3 ft. long	13.75 to 14.25	12.50 to 13.00
Frogs and switches cut apart	12.50 to 13.00	11.00 to 11.50
Per Net Ton		
No. 1 railroad wrought	12.50 to 13.00	10.50 to 11.00
Steel angle bars	11.50 to 12.00	11.00 to 11.50

The present aspect of the lumber market is that of continued quiet. On the west coast there was a rather steady decline of orders from about the last week in October until the first week in December, following which there was appreciable spurt in the sales.

SOUTHERN MILL PRICES		
	November	December
Flooring, 1x4, B. and B. flat	\$49.15	\$48.10
Boards, 1x8, 14 and 16, No. 1	27.20	25.45
Dimension, 2x4, 16, No. 1	23.40	24.35
Dimension, 2x10, 16, No. 1, common	23.20	24.75
Timbers, 4x4 to 8x8, No. 1	22.75	22.60
Timbers, 3x12 to 12x12, No. 1	25.10	25.25
DOUGLAS FIR MILL PRICES		
	November	December
Flooring, 1x4, No. 2, clear, flat	27.00	28.00
Boards, 1x6, 6 to 20, No. 1, common	10.50	10.50
Dimension, 2x4, 16, No. 1, common	11.50	11.50
Dimension, 2x10, 16, No. 1, common	11.50	11.50
Timbers, 6x6 to 8x8, No. 1, common	14.00	14.00
Timbers, 10x10 to 12x12, rough	14.00	14.00

Portland cement prices have changed but little in recent months; quotations for middle western points in car-load lots, not including package, are given in the table below:

Pittsburgh	\$2.02	Milwaukee	\$2.19
Detroit	2.31	Minneapolis	2.26
Chicago	1.97	Davenport	2.22
Duluth	1.95	Cincinnati	2.37

# General News

The Western Pacific has applied for authority to acquire control of the Sacramento Northern through the purchase of its stock, this road consisting of 219 miles of line extending north from Sacramento, Cal.

Pere Marquette officers have made an inspection of the Brazil branch of the Chicago & Eastern Illinois with a view to the former purchasing the property. This branch extends from a junction with the Pere Marquette at La Crosse, Ind., south to Brazil, a distance of about 145 miles.

The state of North Dakota, through its Board of Railway Commissioners, contemplates launching immediately a statewide campaign for the reduction of grade crossing accidents. This is believed to be the first instance of a state department undertaking on its own account a campaign against accidents of this kind.

C. A. Morse, chief engineer of the Chicago, Rock Island & Pacific, has offered a prize of \$10 to the roadmaster on that system who will present the best and most practical plan for the laying of new rail. This contest closed on January 1, 1922, and all papers will be submitted and passed upon by R. H. Ford, assistant chief engineer, and W. H. Petersen and F. T. Beckett, engineers maintenance of way of the first and second districts, respectively.

Upon a rehearing of the request of the New York Central before the Interstate Commerce Commission for authority for the New York Central, the Cleveland, Cincinnati, Chicago & St. Louis and the New York, Chicago & St. Louis to acquire control of the Cleveland Union Terminal Company by the purchase of its capital stock in order to construct and operate a proposed terminal station in Cleveland, the commission reversed its former decision and has tendered the authority requested.

Fatalities among employees of the Pennsylvania System from accidents occurring during the first six months of 1921 show a reduction of 53 per cent over the corresponding period of the preceding year, according to an analysis prepared by the insurance department, and injuries to employees show a reduction of 40 per cent. A study of the accident figures for the first half of this year shows that 35 fatalities arose from employees being struck by trains, 8 fatalities from employees coupling and uncoupling cars, and 8 fatalities from men falling off or between cars.

Floods from heavy rains in the Ohio river basin and the state of California have caused considerable damage to railroads at certain points in these regions. The greatest damage was done at San Diego, Cal., where it was necessary to suspend traffic on both the Atchison, Topeka & Santa Fe and the San Diego & Arizona on December 25. The Santa Fe lost 1,000 ft. of tracks and roadway near Sorrento and in the Rose Canyon and suffered washouts at several other points. In the Ohio region, it was necessary temporarily for the Cleveland, Cincinnati, Chicago & St. Louis, the Southern and the Baltimore & Ohio to abandon the Union station at Cincinnati and service was not resumed at the Central station, except in a small way, until December 28.

Under the Federal Employers' Liability Act, it has been decided in Pennsylvania, that where an employee engaged in interstate commerce employment, on leaving his work, selects a dangerous way to leave the yard where his employer has provided a safe way out he loses the status of an employee in interstate commerce, and when he is subsequently killed by a train while crossing the main track, there can be no recovery from the railroad for his death. The

Supreme Court of the state of Washington has decided that a trackman on the main line of a railroad engaged in interstate commerce who left the section under the direction of the foreman to accompany the foreman on a motor car to another town to get supplies could not recover under the Employers' Liability act for injuries caused by the derailment of the motor car, on the ground that his acts were contrary to the company rules as to leaving the section during working hours.

The Interstate Commerce Commission has authorized the Minneapolis, St. Paul & Sault Ste. Marie to abandon a branch line of four miles in Crow Wing county, Minn., and the Louisiana & Pacific to abandon a 5¼-mile branch of its lines, and has received an application from the Pittsburgh & West Virginia for authority to acquire control of the West Side Belt Railroad, a line of 22 miles, on an agreement providing for the joint operation of both properties by the Pittsburgh & West Virginia. Pursuant to authority recently issued the Delta Southern to abandon its line of 52 miles in Mississippi, this road was sold in three sections at Greenville, Miss., on December 6, the section extending between Richey and Percy having been purchased by J. B. Kellogg, that between Ittadena and Belzoni by W. A. Swift and associates, and the Napanee branch by B. A. Denslow.

Pursuant to authority obtained from the War Department on November 10, the Illinois Central will start within a year the renewal of the superstructure of its crossing over the Ohio river at Cairo, Ill. This crossing comprises nine three-truss spans, of which two are 523½ ft. and seven 405 ft., as well as three 200 ft. deck truss spans. The substructure of the river spans consists of stone masonry piers carried to a depth of 75 ft. below the water level of the river and supported on grillage work on sand, while the approach spans on the south end of the bridge are carried on steel cylinder piers filled with concrete. The work of renewal will involve the replacement of the existing single track spans with double track and the lengthening of the piers at the top from 43 to 52 ft. and their widening from 14 ft. to 17¾ ft. to accommodate the new superstructure. It is estimated that the work will involve an expenditure of \$8,500,000.

Railway Electrification, in addition to being a subject of a report made recently to the President with respect to its application in the vicinity of Washington and Philadelphia in this country, and the subject of a report recently made as to its inauguration in England, has become a prominent subject in Japan, Spain and Chile by the commencement of definite projects in the latter countries. In Spain a contract for the electrification of 40 miles of the Spanish Northern railway has been made with one of the associated companies of the International General Electric Company of New York, this contract constituting the most recent and one of the largest European electrification projects now under development. In Chile a contract has been awarded to the Westinghouse Electric International Company for the immediate electrification of 116 miles of main line, involving 144 miles of track, of the Chilean State railways, this project to involve an expenditure of about \$7,000,000. This is the most important electrification undertaken in 1921 and is the largest single order for electric traction equipment ever received in this country. In Japan, where some electrification has already been developed, the interest has grown to a point where orders have recently been placed with two American electrical concerns for some \$5,000,000 worth of apparatus for hydro-electric development incidental to further electrification.



## Personal Mention

### General

**H. R. Safford**, assistant to the president of the Chicago, Burlington & Quincy, with headquarters at Chicago, Ill., has been elected vice-president, with the same headquarters. He will continue in his present duties and will, in addition, have jurisdiction over all capital improvements and expenditures; the valuation, real estate and industrial departments, insurance, and such other matters as may from time to time be assigned to him. Mr. Safford was born at Madison, Ind., and entered railway service as a rodman on the Illinois Central immediately after his graduation from Purdue University in 1895. From 1897 to 1900 he was resident engineer in charge of construction work, and in the latter year was promoted to roadmaster. From May, 1903, to March, 1905, he was principal assistant engineer, and on the latter date was promoted to assistant chief engineer. In July, 1906, he was promoted to chief engineer, maintenance of way, which position he held until May, 1910, when he left railroad service to become assistant to the president of the Edgar Allen Manganese Steel Company. The following year he was appointed chief engineer of the Grand Trunk, which position he held until 1918, when he entered the service of the United States Railroad Administration as engineering assistant to the regional director of the Central Western region. In February, 1920, he was appointed assistant to the president of the Chicago, Burlington & Quincy, which position he was holding at the time of his recent promotion. Mr. Safford was president of the American Railway Engineering Association in 1920.



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### Engineering

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**W. W. Kelly**, division engineer on the Coast Lines of the Atchison, Topeka & Santa Fe, with headquarters at San Bernardino, Cal., has been promoted to engineer of the Grand division, with headquarters at Los Angeles, to succeed **W. H. Oliver**, killed in a motor car wreck on November 22. **N. B. Clark**, division engineer at Needles, Cal., succeeds Mr. Kelly at San Bernardino. **O. R. West**, assistant division engineer at San Francisco, has been promoted to division engineer to succeed Mr. Clark at Needles. **S. B. Kinnie**, assistant division engineer at Winslow, Ariz., succeeds Mr. West at San Francisco. **R. E. Chambers**, roadmaster of the Phoenix division, with headquarters at Prescott, Ariz., has been appointed assistant division engineer to succeed Mr. Kinnie at Winslow.

**O. R. West**, who was promoted from assistant division engineer on the coast lines of the Atchison, Topeka & Santa Fe at San Francisco to division engineer at Needles, Cal., was born July 19, 1886, at Glendora, Cal., and entered

the service of the Santa Fe in August, 1905, as a chainman. He remained in the service of the Santa Fe as a chainman and rodman until 1908, when he left for another field. He re-entered the service of the Santa Fe in April, 1909, and served in the successive capacities of rodman and transitman until July, 1916, when he was promoted to assistant engineer, with headquarters at San Francisco. He held this position until November 26, 1921, when he was promoted to division engineer, as noted above.

**R. E. Chambers**, who was promoted to assistant division engineer on the Coast lines of the Atchison, Topeka & Santa Fe, with headquarters at Winslow, Ariz., as noted elsewhere in these columns, was born April 23, 1888, at Clayton, Ill. Mr. Chambers entered the service of the Santa Fe, Prescott & Phoenix in January, 1912, as transitman, and served successively as transitman, draftsman, office engineer and superintendent of bridges, buildings and water service until the war period. He was discharged from military service as first lieutenant of engineers and entered the service of the Santa Fe as assistant division engineer of the Phoenix division, with headquarters at Prescott (the Santa Fe having acquired control of the Prescott & Phoenix line). On December 31, 1920, he was appointed roadmaster, and held this position until November 26, 1921, the date of his appointment to assistant division engineer of the Albuquerque division, with headquarters at Winslow, to succeed **S. B. Kinnie**.

**W. W. Kelly**, who was promoted to engineer of the Grand division of the Coast Lines of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, as noted elsewhere, was born at Winfield, Kan., in 1885, and entered the service of the Santa Fe as a chainman after leaving Rose Polytechnic Institute in 1903. He held this position and the subsequent position of rodman on maintenance and construction until September, 1906, when he entered the service of the Chicago, Milwaukee & St. Paul at Milwaukee, Wis., as an instrumentman. In September, 1907, he returned to the Santa Fe, where he was successively transitman, inspector, assistant engineer and chief pilot engineer on valuation until May, 1917, when he was appointed division engineer of the Albuquerque division at Winslow. He held this position until September, 1919, when he was transferred to San Bernardino as division engineer of the Los Angeles division, where he remained until his recent promotion to engineer Grand division at Los Angeles.

**Alvin Chase Harvey**, engineer of grade elimination of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to assistant engineer, with the same headquarters. Mr. Harvey was born at Mansfield, N. Y., December 24, 1883, and upon graduating from the Purdue University in June, 1908, entered the service of the New York, Chicago & St. Louis as a rodman and transitman on station ground surveys between Cleveland, Ohio, and Buffalo, N. Y. In March, 1909, he was promoted to assistant engineer in charge of the East Side grade crossing elimination work at Cleveland and one year later was placed in charge of the double track survey between Broston, N. Y., and Erie, Pa., leaving the work in May, 1910, to take charge of the track elevation at Grand Crossing, Chicago, Ill. In June, 1916, he was appointed assistant engineer in charge of the field work on the Ivanhoe Road grade crossing elimination at Cleveland, and in January, 1917, was made field engineer in charge of the field work on the west side grade crossing elimination construction in the same city. He was promoted to engineer of grade crossing elimination, with headquarters at Cleveland, in September, 1918, having charge of both the field and office work. Coincident with Mr. Harvey's promotion to assistant chief engineer, the office of engineer of grade elimination was abolished.

### Track

**R. A. Erdman** has been appointed roadmaster of the Prairie du Chien division of the Chicago, Milwaukee & St. Paul, with headquarters at Madison, Wis., in place of **E. E. Cush**.

**J. Sullivan**, roadmaster on the Northern division of the Great Northern, with headquarters at Red Lake Falls, Minn., has been transferred to the Breckenridge division, with head-



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the service of the Santa Fe in August, 1905, as a chainman. He remained in the service of the Santa Fe as a chainman and rodman until 1908, when he left for another field. He re-entered the service of the Santa Fe in April, 1909, and served in the successive capacities of rodman and transitman until July, 1916, when he was promoted to assistant engineer, with headquarters at San Francisco. He held this position until November 26, 1921, when he was promoted to division engineer, as noted above.

**R. E. Chambers**, who was promoted to assistant division engineer on the Coast lines of the Atchison, Topeka & Santa Fe, with headquarters at Winslow, Ariz., as noted elsewhere in these columns, was born April 23, 1888, at Clayton, Ill. Mr. Chambers entered the service of the Santa Fe, Prescott & Phoenix in January, 1912, as transitman, and served successively as transitman, draftsman, office engineer and superintendent of bridges, buildings and water service until the war period. He was discharged from military service as first lieutenant of engineers and entered the service of the Santa Fe as assistant division engineer of the Phoenix division, with headquarters at Prescott (the Santa Fe having acquired control of the Prescott & Phoenix line). On December 31, 1920, he was appointed roadmaster, and held this position until November 26, 1921, the date of his appointment to assistant division engineer of the Albuquerque division, with headquarters at Winslow, to succeed **S. B. Kinnie**.

**W. W. Kelly**, who was promoted to engineer of the Grand division of the Coast Lines of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, as noted elsewhere, was born at Winfield, Kan., in 1885, and entered the service of the Santa Fe as a chainman after leaving Rose Polytechnic Institute in 1903. He held this position and the subsequent position of rodman on maintenance and construction until September, 1906, when he entered the service of the Chicago, Milwaukee & St. Paul at Milwaukee, Wis., as an instrumentman. In September, 1907, he returned to the Santa Fe, where he was successively transitman, inspector, assistant engineer and chief pilot engineer on valuation until May, 1917, when he was appointed division engineer of the Albuquerque division at Winslow. He held this position until September, 1919, when he was transferred to San Bernardino as division engineer of the Los Angeles division, where he remained until his recent promotion to engineer Grand division at Los Angeles.

**Alvin Chase Harvey**, engineer of grade elimination of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to assistant engineer, with the same headquarters. Mr. Harvey was born at Mansfield, N. Y., December 24, 1883, and upon graduating from the Purdue University in June, 1908, entered the service of the New York, Chicago & St. Louis as a rodman and transitman on station ground surveys between Cleveland, Ohio, and Buffalo, N. Y. In March, 1909, he was promoted to assistant engineer in charge of the East Side grade crossing elimination work at Cleveland and one year later was placed in charge of the double track survey between Broston, N. Y., and Erie, Pa., leaving the work in May, 1910, to take charge of the track elevation at Grand Crossing, Chicago, Ill. In June, 1916, he was appointed assistant engineer in charge of the field work on the Ivanhoe Road grade crossing elimination at Cleveland, and in January, 1917, was made field engineer in charge of the field work on the west side grade crossing elimination construction in the same city. He was promoted to engineer of grade crossing elimination, with headquarters at Cleveland, in September, 1918, having charge of both the field and office work. Coincident with Mr. Harvey's promotion to assistant chief engineer, the office of engineer of grade elimination was abolished.

### Track

**R. A. Erdman** has been appointed roadmaster of the Prairie du Chien division of the Chicago, Milwaukee & St. Paul, with headquarters at Madison, Wis., in place of **E. E. Cush**.

**J. Sullivan**, roadmaster on the Northern division of the Great Northern, with headquarters at Red Lake Falls, Minn., has been transferred to the Breckenridge division, with head-



quarters at Breckenridge, Minn., succeeding **H. O. Warp**, resigned.

**J. Telford**, roadmaster on the Canadian Pacific, with headquarters at Trenton, Ont., has been transferred to the St. John and Fredericton subdivision, with headquarters at McAdam, N. B., to succeed **W. H. Noyes**, transferred.

**John W. Hruska**, whose promotion to supervisor of track on the Minneapolis & St. Louis, with headquarters at Conde, S. D., was noted in last month's issue, was born at Montgomery, Minn., in May, 1889. Mr. Hruska entered the service of the Minneapolis & St. Louis in 1903 and has been in the continuous employ of this road since that time.

**S. J. Covey**, assistant roadmaster on the El Paso-Amarillo division of the Chicago, Rock Island & Pacific, with headquarters at Amarillo, Tex., has been promoted to roadmaster, with headquarters at Pratt, Kan., succeeding **J. Blalock**, resigned. **J. E. Crawford** has been appointed acting assistant roadmaster, with headquarters at Amarillo, Tex., in place of Mr. Covey.

**George Warner**, roadmaster of the Nipigon subdivision of the Canadian National, Eastern Lines, with headquarters at Jellicoe, Ont., has been transferred to the Ruel subdivision, with headquarters at Capreol, Ont., in place of **P. Vicks**, who has been transferred to the Oba subdivision, with headquarters at Hornepayne, Ont., to succeed **P. Bohan**, transferred to the Nipigon subdivision, with headquarters at Jellicoe, Ont., succeeding Mr. Warner.

**F. S. Purdy**, roadmaster on the Coast Lines of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, has been promoted to acting inspector of track and roadway, to succeed **J. E. McNeil**, injured in a motor car accident November 22 and on leave of absence. **E. E. Corwin**, chief clerk to division engineer at San Bernardino, Cal., succeeds Mr. Purdy at Los Angeles. **R. L. Borden**, section foreman at Fullerton, has been promoted to roadmaster, with headquarters at Winslow, Ariz., to succeed **J. A. Rohrer**, Mr. Rohrer having been transferred to Wickenburg, Ariz., to succeed **W. S. Bowman**, killed in the motor car accident mentioned above.

**G. A. Larson**, extra gang foreman on the Coast Extension of the Chicago, Milwaukee & St. Paul, has been promoted to roadmaster in the Chicago terminal, with headquarters at Cragin, Ill., succeeding **F. E. Crabbs**. Mr. Larson was born in Sweden on July 4, 1881, and entered railway service with the Pere Marquette in 1899 as a laborer, serving successively as section foreman and extra gang foreman until 1908. From 1908 to 1913 he served as extra gang foreman on the Coast extension of the Chicago, Milwaukee & St. Paul, and in the latter year was promoted to roadmaster. He later served as extra gang foreman and assistant roadmaster on this road and from 1917 to 1919 was in military service, returning to the position of extra gang foreman on the St. Paul in the latter year, which position he held at the time of his recent promotion.

### Purchases and Stores

**I. S. Fairchild** has been appointed storekeeper of the New Orleans Terminal division of the Illinois Central, with headquarters at New Orleans, La.

**E. Griffiths**, division storekeeper of the Chicago, Milwaukee & St. Paul, with headquarters at Perry, Iowa, has been transferred to Moberg, S. D., succeeding **G. L. Juel**, who has been transferred to Malden, Wash., succeeding **H. R. Meyer**, who has been transferred to Perry to succeed Mr. Griffiths.

**B. W. Griffith**, district storekeeper of the New York Central, Lines West, with headquarters at Collinwood, Ohio, has been promoted to assistant general storekeeper, with the same headquarters, and will be succeeded by **F. J. McMahon**. **A. L. Prentice**, division storekeeper, with headquarters at Elkhart, Ind., has been promoted to assistant general storekeeper, with headquarters at Collinwood, and he will be succeeded by **C. F. Heidenreich**.

**J. S. McAuley**, assistant division storekeeper on the Southern Pacific, with headquarters at Sparks, Nev., has been promoted to division storekeeper, with headquarters at Portland, Ore., succeeding **H. J. Smith**, who has become chief

clerk to the general storekeeper at San Francisco, Cal. **J. Neph**, storekeeper of the San Joaquin division, with headquarters at Bakersfield, Cal., has been transferred to the Los Angeles division, with headquarters at Los Angeles, succeeding **J. H. Collins**, deceased. **J. F. Brown**, storekeeper of the Shasta division, with headquarters at Dunsmuir, Cal., succeeds Mr. Neph, and **F. L. Doss** succeeds Mr. Brown.

### Obituary

**C. H. Prior**, the builder of the first line of the Chicago, Milwaukee & St. Paul into Minneapolis, died November 13 in that city at the age of 88 years.

**Lord Mount Stephen**, pioneer railroad builder and first president of the Canadian Pacific, died November 30 in England at the age of 92 years. Mr. Stephen was born at Forren in Bamsfshire, Scotland, in 1829, and took up his residence in Canada in 1850, some time following which he entered into business relations with Lord Strathcona, which led to the construction of the Canadian Pacific. With a plan in mind for undertaking such a venture, the two men joined forces with the late J. J. Hill and acquired the St. Paul & Pacific, which line was built through from St. Paul to Winnipeg, thus making possible the subsequent building of the Canadian Pacific.

**William S. Bowman**, roadmaster on the Atchison, Topeka & Santa Fe, with headquarters at Wickenburg, Ariz., who was killed in the motor car accident noted in the December issue, was born in Illinois, June 22, 1880, and entered service with the Sierra Railway as a section foreman at Jamestown, Cal., in 1908, after having been associated with various mercantile and supply companies in California. In October, 1908, he was appointed a section foreman on the Santa Fe at Angiola, Cal., and continued in this capacity at Merced and Bakersfield on the Valley division until December 27, 1920, when he was appointed roadmaster, with headquarters at Wickenburg, Ariz., the position he held at the time of his death.

**Sir Douglas Fox**, consulting engineer, London, England, and an international figure in railway construction, died November 12 in London. Mr. Fox was born in 1840 at Bellefield near Birmingham, England, and is known to American engineers particularly because of his connection with the construction of the Great Zambesi river bridge in South Africa, the construction of the Cape Government Railway in Africa, the construction of railways in Argentina, Columbia and Brazil, and as one of the founders of the British Engineering Standards Committee. During recent years, Mr. Fox has devoted much of his time to designs and estimates in connection with the proposed tunnel under the English Channel.

**Sebastian Wimmer**, at one time chief engineer on the construction of the Pittsburgh & Lake Erie and the builder of the New York City & Northern Railroad, now a part of the New York Central System, died recently at St. Vincent, Pa., at the age of 90 years. Mr. Wimmer was born in Bavaria in 1831. He came to America in 1851, three years after which he entered railroad service as an assistant engineer on construction of the Allegheny Valley Railroad. He entered the service of the Pennsylvania in 1861 and in 1865 was placed in charge of a portion of the construction of the Imperial Mexican Railway, which position he held for three years, thereafter becoming associated with engineering work in other parts of the country until his connection with the Pittsburgh & Lake Erie and the New York City & Northern as noted above.

**J. A. Jaeger**, division engineer of the Phoenix division of the Atchison, Topeka & Santa Fe, who among others was killed in the motor car accident noted in the December issue, was born at Clarksville, Mo., on January 4, 1867, and entered railway service with the Missouri Pacific shortly after the completion of his engineering studies at the University of Missouri in 1886. In 1891 Mr. Jaeger had charge of the construction of a municipal pipe line between Florence and Pueblo, Colo., and from 1893 to 1896 he was employed in preliminary survey and construction work on the Florence & Cripple Creek railway, except during the year 1895, when he was in charge of construction of the Gila Valley & Northern



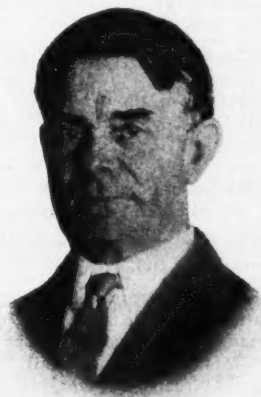
railway in Arizona. From 1897 to 1899 he was locating engineer on the Santa Fe, Prescott & Phoenix, being associated thereafter until 1902 with the construction of the Branch Mountain and Big Gulch branches of the Prescott & Eastern, during which he located and constructed the Crown King switchback. Continuing in charge of construction on the Prescott & Eastern until 1905, Mr. Jaeger held until 1906 the position of engineer of construction of the Arizona and California lines of the Prescott & Phoenix and in 1907 was appointed chief engineer, which position he held until August, 1920, when he became division engineer of the Phoenix division, following the consolidation of that road with the Santa Fe.

**John D. Besler**, a member of the vice-president's staff of the Chicago, Burlington & Quincy, with headquarters at Galesburg, Ill., and at one time a roadmaster, died suddenly on the evening of December 19 at his home at Galesburg, Ill. Mr. Besler was born on April 10, 1833, and entered railroad service in November, 1855, as a track laborer on the Chicago, Burlington & Quincy at Galva, Ill. He was promoted successively from this position to section foreman, conductor of a construction train, roadmaster, assistant division superintendent, division superintendent, and in 1882 was made division superintendent of the Illinois lines. Three years later Mr. Besler was promoted to general superintendent, which position he held until August 1, 1902, when he was assigned to special duties on the staff of the vice-president in charge of operation, the position he held at the time of his death. Mr. Besler was the father of W. G. Besler, president and general manager of the Central of New Jersey.

**W. H. Oliver**, engineer of the Grand division of the Coast Lines of the Atchison, Topeka & Santa Fe, whose death with that of four other officers following a motor car accident was noted in the December issue, was born at Fergusville, N. Y., on March 11, 1866, and entered service with the Santa Fe as a transitman on the Los Angeles division in June, 1895. He held this position until April, 1900, when he joined the engineering forces of the Mexican Central Railway, with which he served in the successive capacities of draftsman, levelman, transitman on location and assistant engineer on construction on the line from Sapotlan to Colimo until January 1, 1902, when he re-entered the service of the Santa Fe as a transitman on the Los Angeles division. In January, 1905, he was promoted to assistant engineer and in March, 1906, to division engineer of the Arizona division, with headquarters at Needles, Cal. He held this position until June, 1915, when he was transferred to San Bernardino as division engineer of the Los Angeles division, where he remained until October, 1919, when he was appointed engineer of the Grand division of the Coast Lines, with headquarters at Los Angeles.



John D. Besler



W. H. Oliver

## Construction News

**The Atchison, Topeka & Santa Fe** has closed bids for the construction of three oil storage tanks at Argentine, Kan. This company, noted in the November issue as contemplating the construction of an addition to its Alvarado Hotel at Albuquerque, N. M., to cost approximately \$300,000, has awarded the contract for this work to Charles Fellows, Los Angeles, Cal. The same company will also construct a new laundry building and repair the old one at Albuquerque.

**The Baltimore & Ohio**, in conjunction with the Pennsylvania and the Erie, contemplates the elimination of its crossing at Forge street, Akron, Ohio.

**The Benton & Saline County Railway Company** has been organized to construct a line of about three miles from Benton, Ark., to a short distance beyond Glenville Park, along the Saline river.

**The Canadian National** contemplates extending its Vancouver Island line approximately ten miles into the Cowichan Lake territory. This company has awarded a contract to G. M. McLeod, Winnipeg, Man., for the construction of a pedestrian subway under its tracks at Dauphin, Man., and has awarded a contract to J. H. Simmons, Winnipeg, Man., for the construction of a frame warehouse at Prince Rupert, B. C.

**The Canadian Pacific** contemplates the reconstruction of a station at Schreiber, Ont., to replace one destroyed by fire last winter. The work will cost about \$80,000.

The Canadian Pacific is preparing plans and estimates for the construction of a new freight shed and team tracks at Windsor, Ont.

**The Central of Georgia** has closed bids for the construction of a 500-ton concrete coaling station to be erected at Columbus, Ga.

**The Chicago & Alton** contemplates the construction of a subway at Division street, Bloomington, Ill.

**The Chicago, Burlington & Quincy** will construct about 30 miles of line from Hardin, Mont., on its main line, into the Soap Creek oil field area. Surveys for this work have recently been started. This company contemplates ultimately extending this line further north into the Soap Creek Valley a distance of 14 miles to open an area where the Holly Sugar Corporation has a large acreage of sugar beet land. The construction of new passenger and freight depots at Aurora, Ill., as an element of the track elevation work at this point, is being considered in connection with the program for the year's work, and it is also contemplated to construct the first unit of a locomotive shop at Denver, Colo.

**The Chicago, Milwaukee & Gary** has applied to the Interstate Commerce Commission for authority to construct an extension between Aurora and Joliet, Ill., where the company now operates over the tracks of the Elgin, Joliet & Eastern.

**The Chicago & North Western** contemplates the extension and improvement of its car and locomotive shops at Winona, Minn., which will involve an estimated cost of approximately \$500,000. While preliminary plans have been drawn, no definite time has been set for the commencing of this work. This company also contemplates the construction of a station at Sterling, Ill.

**The Chicago, Peoria & St. Louis** will reconstruct at Havana, Ill., its freight station, which was destroyed by fire on November 18.

**The Chicago Union Station**, noted in the December issue as having closed bids for 2,600 sq. yd. of concrete track slabs, has awarded the contract to W. J. Newman & Company, Chicago.

**The Cumberland & Manchester** has recently purchased and is equipping a new ballast plant at a quarry along its line. It is also enlarging its shop facilities and installing new hump scales and additional side tracks at Heidrick, Ky. These improvements will cost approximately \$250,000 and are expected to be completed during the early part of the year.

**The Delaware, Lackawanna & Western** has applied to the General Electric Company and the Westinghouse Electric Manufacturing Company for estimates covering the proposed electrification of about 40 miles of line near Scranton, Pa., this work to involve an expenditure of about \$5,000,000.

**The Erie** has applied to the New York authorities for permission to construct a two-story pier, 100 ft. by 800 ft., at Weehawken, N. J., to replace one of four recently destroyed by fire.

**The Gilmore & Pittsburgh**, a line extending from Salmon and Gilmore in Idaho, through the Rocky mountains to Armstead, Mont., on the Oregon Short Line, has under consideration the leasing of trackage and rights over the Oregon Line to Dillon and the extending of a line north from Dillon to enable it to enter Whitehall, Mont., on the Northern Pacific.

**The Great Northern** contemplates the construction of a second main track between Lamona, Wash., and Bluestem, a distance of 22 miles.

**The Gulf, Colorado & Santa Fe** has started the construction of a subway under its three tracks at South Adams street, Fort Worth, Tex., the work involving the placing of 1,000 yards of concrete, 9,000 yards of embankment and 7,000 yards of excavation.

The Gulf, Colorado & Santa Fe will construct a two-story brick depot at Brenham, Tex., to cost approximately \$40,000.

**The Illinois Central** closed bids January 4 for the construction of a frame passenger and freight station, 96 ft. by 24 ft., at Belmont, Miss.

The Illinois Central, noted in the November issue as applying to the war department for permission to double track its bridge across the Ohio river at Cairo, Ill., at an estimated cost of \$8,482,000, has received the government's approval for this work, and contemplates commencing construction on the project in the near future. This company has awarded a contract for the construction of a new freight house and the enlarging of its passenger depot at West Frankfort, Ill., to the Zitterell Construction Company, Webster City, Iowa, and has awarded a contract to M. L. Windham, Centralia, Ill., for the construction of a track  $1\frac{3}{4}$  miles long to extend from a point on the main line to the Shamrock coal mine, near Providence, Ky. This company, noted in the December issue as receiving bids for the construction of a frame storehouse at Clinton, Ill., has awarded the contract to Joseph E. Nelson & Sons, Chicago. This work will cost approximately \$20,000. This company is receiving bids for the construction of a car shed at McComb, Miss., also bids for the construction of a frame viaduct over its tracks at Fulton, Ky.

**The Illinois Terminal** has been granted authority by the Interstate Commerce Commission to extend its line from Formosa, Ill., to O'Fallon, a distance of approximately 14 miles. This work will involve an expenditure of approximately \$650,000.

**The Louisville & Nashville** contemplates the construction of a reinforced concrete viaduct over its tracks on Lebanon avenue, Belleville, Ill., and to this end has submitted plans for this work to the city for approval.

**The Missouri Pacific** has awarded a contract to the T. S. Leake Construction Company, Chicago, for the construction of a 25 ft. extension to its roundhouse at Hoisington, Kan., and will accept bids until January 9 for the construction of a frame freight and passenger station at Zeigler, Ill., and bids for remodeling the brick roundhouse at Coffeyville, Kan.

The Missouri Pacific contemplates improving and enlarging its station at Newport, Ark., at an estimated cost of \$10,000. This company also contemplates the construction of a station at Harrisburg, Ark., and one at Hoxie, for which plans have been submitted to the Arkansas Railroad Commission. This company has awarded a contract to Gillespie & Daly for the construction of a two-story interlocking and signal tower at Hiawatha, Kan.

**Morgan's Louisiana & Texas** has been ordered by the Louisiana Public Service Commission to construct a station at Franklin, La., according to an arrangement under which plans are to be submitted to the commission for its approval

within one year and the work commenced within sixty days after the official sanction of the plans.

**The Nashville, Chattanooga & St. Louis** has under consideration the construction of an underpass at the intersection of the state highway and the company's tracks at White Bluff, Tenn.

**The New Sabinas Company, Ltd.**, a coal interest of the Vickers Company, London, England, has awarded the contract for the design and construction of a fireproof, reinforced concrete and steel coal washing plant and power plant at the Cloete mines, near Sabinas, Coah., Mex., to the Roberts & Schaefer Company, Chicago. Work has started on the project, which is to cost approximately \$300,000.

**The New York, New Haven & Hartford** has awarded a contract to the Roberts & Schaefer Company for the complete design and construction of two 1,200-ton capacity, three-track, automatic electric locomotive coaling stations, one for erection at East Hartford, Conn., and the second, at Providence, R. I. The contract price is \$110,000.

**New York City**, ordered by the state legislature to construct a railway tunnel under the narrows from Staten Island to Brooklyn for freight and passenger traffic, has prepared a proposal for the review of the legislature on this project. This proposal calls for authority to acquire all railway lines on Staten Island, including the Baltimore & Ohio's subsidiary, the Staten Island Rapid Transit, and provides for through freight connection between Long Island and the carriers terminating in New Jersey, as well as rapid transit facilities for one of the city's boroughs now dependent entirely upon ferry boat transportation. The project as outlined will involve an expenditure of approximately \$225,000. This plan was promulgated without consultation with the Transit Commission or the port authorities and the ideas of these bodies are at variance with those of the municipality.

**The Oregon-Washington Railroad & Navigation Co.** has been ordered by the city council of Seattle, Wash., to construct a temporary trestle over its Argo yards at First avenue in that city.

**The Osage Railway Company** has obtained authority from the Interstate Commerce Commission for permission to construct 11 miles of railroad from Foraker, Okla., to the Osage County oil fields in that state, and has awarded a contract for the grading of the road to R. L. Plunkett, Pawhuska, Okla., and the contract for the construction of the bridges, trestles and culverts to J. A. Moore, Foraker.

**The Pacific Great Eastern** contemplates the reconstruction of its wharves at Squamish, B. C., which were recently washed away by heavy floods. The estimated cost of the work is \$120,000.

**The Sabine & Neches** has been incorporated to build a railroad from Ruliff, Tex., westward via Deweyville to Gist, a distance of about 16 miles. The capitalization of the company is \$100,000. The directors of this new road are R. J. Wilson, J. P. Hall and C. C. Smith of Deweyville; A. J. Peavy, R. T. Moore and C. C. Cary of Shreveport, La.; J. B. Smythe and C. E. Walden of Beaumont, Tex., and W. H. Mangen of Westlake, La.

**The Southern** contemplates the construction of a station at Riceville, Tenn.

**The Southern Pacific** contemplates the construction of a station at Currie, Tex., with company forces. This company, noted in the December issue as contemplating the construction of a levee fronting its yard at Algiers (New Orleans), La., has reached a final agreement with the Orleans Parish Levee Board, and will begin construction about February 1, 1922. The project will cost about \$185,000, of which \$25,000 will be contributed by the Levee Board in consideration of the public interest in the structure.

The Southern Pacific has been requested by the Board of State Harbor Commissioners of California to remove its trestle across Channel street, San Francisco, Cal., and substitute in its place a drawbridge or similar structure. It is held that the present trestle prevents full and complete use of the street for commerce and navigation. The matter is now before the state railroad commission. This road in an effort to avoid the necessity of constructing the station has



petitioned the California Railroad Commission for another rehearing.

The Tampa Southern contemplates a 12 mile extension of its line from Bradentown, Fla., to Sarasota.

The Temiskaming & Northern Ontario, noted in the November issue as planning a 70-mile extension of its line northward from Cochrane to Smoky Falls in the near future, this extension to involve the expenditure of about \$3,500,000, will soon receive bids for this work, according to Vice-Consul J. H. Wetmore, North Bay, Ontario. The vice-consul offers to furnish the specifications for the work to any responsible contracting firm upon request as soon as they are available and will also undertake to deliver to the railway commissioners any bids sent in his care.

The Texas Mexican contemplates the construction of a depot at Mirando City, Tex., the size of this station to depend upon the volume of traffic which the new instituted oil industry develops at this point.

The Texas & Pacific has been ordered by the Louisiana Public Service Commission to construct a station at Innis, La., plans for which must be submitted to the commission by February 11, 1922.

The Thomas Gravel Company contemplates the construction of a six-mile railroad line from Alexandria, La.

The Union Pacific, in conjunction with the U. S. Department of Agriculture, and the state of Utah, will soon construct a viaduct over its tracks and the Weber river, Ogden, Utah, which will cost approximately \$200,000. The structure will be of reinforced concrete, except for two bridges which will be steel of a through truss design. The cost of the work will be divided among the three parties, the railroad paying one-half. It is expected that bids for this work will be called for during the first part of the coming year and that the construction will be completed during the summer.

The Union Station, Los Angeles, Cal., the Atchison, Topeka & Santa Fe, the Southern Pacific and the Los Angeles & Salt Lake, have been ordered by the Railroad Commission of California to erect a union station on the Plaza site, Los Angeles, Cal. This order is contained in a decision on the rehearing of the Los Angeles terminal case, which, with certain modifications, reaffirmed the former ruling by that body.

The Wabash contemplates the construction of a station at Centralia, Mo., concerning which no definite building plans have as yet been made.

### Equipment and Supplies

The Atlantic Coast Line has ordered 15,000 tons of rail from the United States Steel Corporation.

The Canadian National recently placed an order for about 40,000 tons of rail, equally divided between the Algoma Steel Corporation and the Dominion Steel Corporation, Sydney.

The Chicago, Burlington & Quincy is negotiating with the Illinois Steel Company and the Colorado Fuel & Iron Company for approximately 25,000 tons of rails for delivery in 1922.

The Erie will let contracts in the near future for 37,500 tons of rail for its 1922 requirements.

The Grand Trunk ordered recently 15,000 tons of rail from the Dominion Iron & Steel Company and 14,000 tons from the Algoma Steel Corporation.

The Kansas City Terminal is in the market for 1,000 tons of 90-lb. rails and 3,000 angle bars.

The Kansas, Oklahoma & Gulf has awarded a contract for 473 tons of steel for a bridge in Muskogee County, Okla., to the Pan-American Bridge Company, Newcastle, Ind.

The Kansas City Southern and the Erie have awarded contracts with the U. S. Steel Corporation respectively for 6000 and 4000 tons of rail.

The Louisville & Nashville is inquiring for 5000 tons of rail.

The New York Central Lines have placed contracts for 125,000 tons of rail, with an option of 25,000 tons additional.

The Texas & Pacific has ordered 15,000 tons of rail from the United States Steel Corporation, New York City.

## Supply Trade News

### General

The Keller Pneumatic Tool Company, Grand Haven, Mich., has changed its name to William H. Keller, Incorporated.

The Blaw-Knox Company, Pittsburgh, Pa., has moved its New York office from the City Investing building to the Carbide & Carbon building, 30 East 42nd street.

The Osgood Company, Marion, Ohio, has opened a branch sales office at 1211 Conway building, Chicago, of which Arthur B. Sonneborn has been appointed manager.

The General Contracting & Engineering Company has removed its office from 280 Broadway to new and larger offices in the Barrett building, 40 Rector street, New York City.

The Texas Company, New York City, has consolidated its traffic and railway sales departments into one department known as the railway traffic and sales department. The headquarters of G. L. Noble, vice-president; William Jervis, manager, and W. E. Greenwood, assistant manager, are at 17 Battery place, New York City, which will also be the headquarters of J. E. Symons, superintendent of the lubricating division of the department. W. H. Barrows has been appointed district manager, Houston, Tex.

### Personal

E. R. Mason has been appointed eastern and export representative of Brown & Co., Inc.-Wayne Iron & Steel Works, Pittsburgh, Pa., with headquarters at the New York City offices of Brown & Co., Inc., room 2038, Grand Central Terminal.

John L. Artmaier, eastern sales manager of the Buda Company, in charge of the New York office, has been appointed sales manager of the railroad department with headquarters at Chicago. J. E. Murray, formerly assistant to Mr. Artmaier, has been appointed eastern sales manager and J. H. Maher, formerly representing the company at Buenos Aires, Argentine, has been appointed eastern export manager.

Charles A. Robinson, until about a year ago vice-president in charge of sales of the Lackawanna Steel Company, Buffalo, N. Y., has been elected vice-president in charge of sales of the rail division of the Leland Steel Company, Chicago. Fifteen years ago Mr. Robinson was associated with the Leland Steel Company, resigning to join the Lackawanna Steel Company as division manager of sales at Chicago.

R. C. Campbell, formerly vice-president of the Duncan Lumber Company, has been appointed manager of the car and railroad material department of the Burton-Beebe Lumber Company, Seattle, Wash., with headquarters at Chicago. Mr. Campbell will also handle long leaf yellow pine for the J. H. Burton & Co., Inc., of New York and Mobile, Ala. The Burton-Beebe Lumber Company has moved its Chicago office to the Lumber Exchange building.

Thomas Murray, assistant secretary and assistant treasurer of the United States Steel Corporation at New York, died December 27 at his home in Sparkhill, N. Y. Mr. Murray was also a director of the corporation and a number of its subsidiaries. He was born in Jersey City, N. J., December 14, 1867, and entered the service of the Federal Steel Company in May, 1894, where he remained until April, 1901, when he was appointed assistant secretary of the United States Steel Corporation upon its organization. He was appointed also assistant treasurer of the organization November 11, 1919.

Orville C. Mann, inventor of many railroad appliances, died at Oak Park, Ill., December 15. Mr. Mann was born at Bath, N. H., July 22, 1859, and in 1878, entered railway service with the Chicago, Milwaukee & St. Paul. In 1901, after serving that road on the Iowa and Dakota division, he came to Chicago, and entered the supply trade business as a manufacturer of smoke jacks. Later he became associated with E. McCann, superintendent of bridges and buildings of the Atchison, Topeka & Santa Fe, who had perfected a grader and took over the entire interests of this company. Recently



Mr. Mann had concerned himself with the perfection of other devices which he had invented.

**David T. Hallberg**, assistant general sales agent of the P. & M. Company, with headquarters at Chicago, has been promoted to general sales agent, effective January 1, 1922. Mr. Hallberg was born at Ottumwa, Iowa, September 11, 1885, and, after completing his public school studies in that city, he entered the printing business in Chicago. Leaving this employment in 1905, he entered the passenger and advertising department of the Atchison, Topeka & Santa Fe, and later was appointed western representative of the Santa Fe Employees' Magazine. He remained in that position until 1910, when he entered the service of the P. & M. Company as material inspector, shortly thereafter becoming western representative of the company and in January, 1918, sales representative at Chicago. He was promoted to assistant general sales agent in June, 1918, the duties of general sales agent of the company at that time and until Mr. Hallberg's recent promotion having been handled by Fred N. Baylies, vice president.



David T. Hallberg

**John W. Duntley**, one of the founders of the Chicago Pneumatic Tool Company and from 1895 to 1909 president of that concern, was killed by an automobile truck at Chicago on December 15. Mr. Duntley was born at Wyandotte, Mich., on August 16, 1863, and entered business as a foundryman in 1878. From 1884 to 1895 he was engaged in the railway supply business and upon the latter date organized the Chicago Pneumatic Tool Company. From this date to 1909 he was engaged in expanding this organization and enlarging the scope of the business both in this country and abroad. In 1909 he organized and became president of the Duntley Manufacturing Company, manufacturers of the pneumatic cleaners. Of late years Mr. Duntley has devoted his energies to the Duntley Automobile Accessory Company, Chicago, of which he was president. He was also president of the Libertad Mining & Smelting Company and in 1900 was decorated with the cross of the Legion of Honor by the president of France.

### Trade Publications

**Crawling Tractor Crane.**—The Industrial Works, Bay City Mich., has just issued a new catalog, No. 113, illustrating and describing its type BC crawling tractor crane of 20,000 lb. capacity. This crane is particularly adapted for use in railway reclamation and storage yards and small railway construction work.

**Valves.**—The Pratt & Cady Co., Inc., Reading, Pa., has issued catalogue No. 6, 161 pages, illustrated and bound in cloth descriptive of the brass and iron body valves and asbestos packed cocks manufactured by this company. The text includes full information relative to the different types and tables of sizes, prices and fittings.

**Ash Conveyors.**—The Conveyor Corporation of America, Chicago, has recently issued a booklet on its line of steam jet ash conveyors. This booklet entitled "The Proof of the Pudding" contains reproductions of 70 letters regarding the service obtained with this equipment. The list of users commending the device includes several prominent railroads.

**Thawing Outfits.**—The Macleod Company, Cincinnati, Ohio, has issued an 8-page booklet, illustrating and describing its several types of oil burning torches for thawing out frozen ground, melting snow and ice around tracks, cars, turntables, ash hoists, etc. This equipment is designed to

burn kerosene oil and is manufactured in a variety of types for various purposes.

**Start the Job Right.**—An 8-page, illustrated folder has been issued by the National Hoisting Engine Company, Harrison, N. J., descriptive of the line of steam hammers, hoists, cableways and derricks manufactured by this company. The folder is well illustrated showing photographs of equipment in actual work driving piles and sheeting and in doing other miscellaneous work under varying conditions and surroundings.

**Air Lifts.**—The Sullivan Machinery Company has issued bulletin No. 71-G, describing air lift pumping systems, manufactured by that company. This is a revision and explanation of the previous bulletin covering the same subject. In addition to describing air lift pumping equipment, the bulletin gives extensive tables relating to hydraulic constants, pipes, and other mathematical information of value in connection with the solution of hydraulic problems.

**Electric Trucks.**—The Baker R. & L. Company, Cleveland, Ohio, has issued a 32-page catalogue and several bulletins, describing and illustrating its extensive line of electric tractors and trucks for the handling of materials on platforms, tracks, in freight houses, etc. The catalogue describes the manufacture of the trucks in detail and contains many illustrations of the several types of Baker trucks and the wide variety of material-handling uses to which they are being applied.

**Gas Engines.**—The Hadfield-Penfield Steel Company, Bucyrus, Ohio, has recently published a 29-page booklet illustrating and describing the "Standard" fuel oil engine. This engine is of the Diesel type and is manufactured in vertical and horizontal models. The booklet devotes special attention to the vertical engines which are made in sizes ranging from two-cylinders to six-cylinders. Specifications of dimensions are given for these engines together with a chart showing the fuel consumption at different loads and speeds.

**Oil Engines.**—An illustrated booklet of 22 pages has recently been issued by the Vacuum Oil Company, New York, which treats of the construction, operation and lubrication of oil engines of the surface ignition type. The text covers all of the important points in connection with this class of engines and covers in detail such problems as classification of type, the fields of service, principles of construction and operation, cooling, fuel, method of lubrication, lubricating oils and deposits. The illustrations show various types and parts, as well as the various steps in the cycles of operation.

**Specifications for Track Material.**—Robert W. Hunt & Company, Chicago, has issued a booklet of 50-pages containing the specifications for track material as established by the American Society for Testing Materials on carbon steel rail, open-hearth steel girder and tie rails, low carbon steel splice bars, medium carbon steel splice bars, high carbon steel splice bars, extra high carbon steel splice bars, high carbon steel splice bars, low carbon steel track bolts, quenched carbon steel track bolts, quenched alloy steel track bolts, steel track spikes, steel screw spikes and steel tie plates.

**Stationary Steam Engines.**—The Vacuum Oil Company, New York, has issued a large size, 32 page, illustrated booklet dealing with the subject of steam valve and cylinder lubrication of stationary steam engines. This booklet is along educational lines showing, as it does, by text and illustrations, the various types of stationary steam engines, their method or methods of operation, proper methods of lubrication and the selection of oils. In addition to this, considerable information is given regarding boiler plant and steam production, covering such details as steam quality, exhaust steam, oil in exhaust steam, extraction of oil and feed water treatment.

**Long Life for Wood.**—The Barrett Company, New York City, has recently issued a 16-page, illustrated booklet descriptive of the various uses for which that company's timber preservations are adapted. The text discusses the many classes of timbers which can be treated advantageously, the structures or parts of structures which should be of treated timber and the method of applying the preservative.

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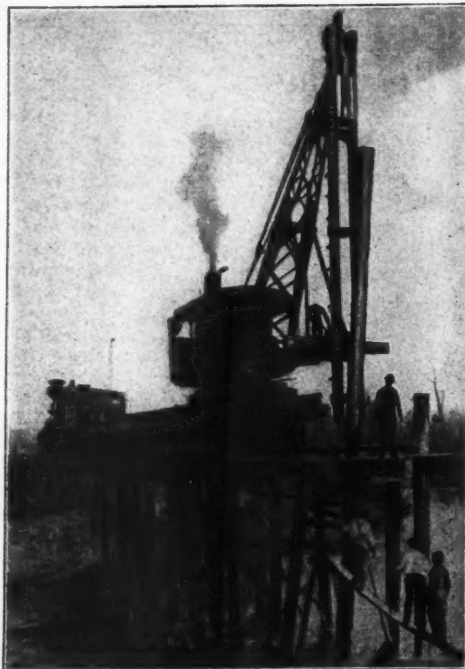
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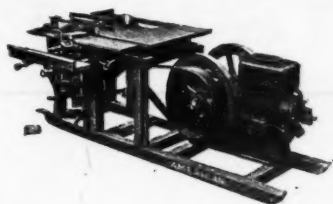
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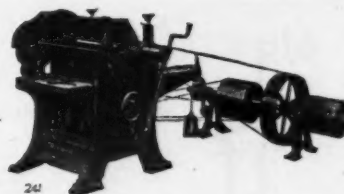
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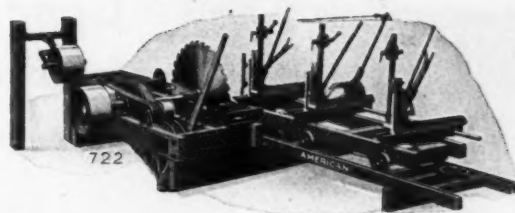


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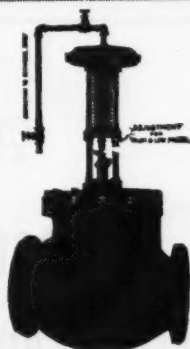
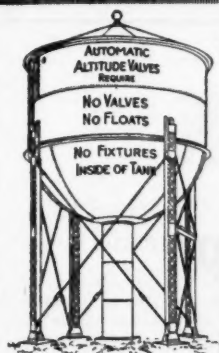


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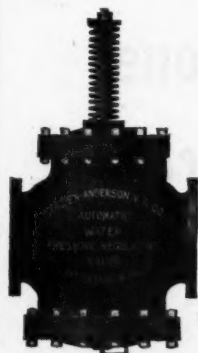
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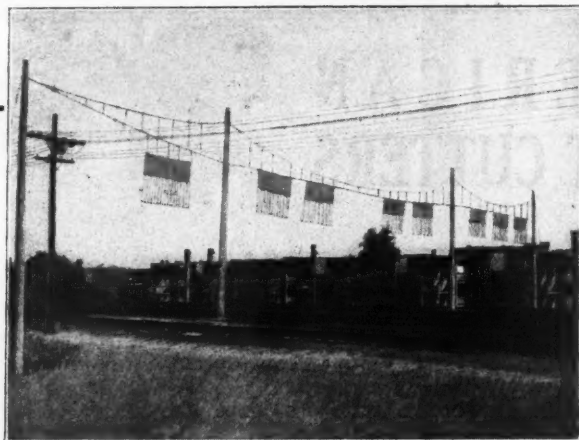
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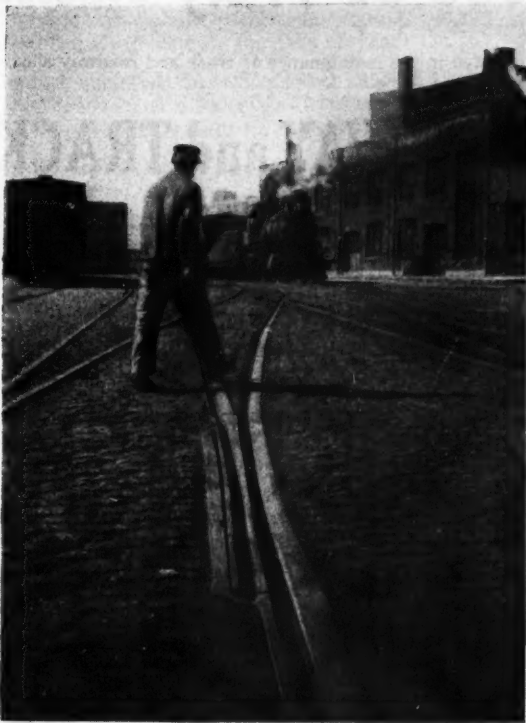


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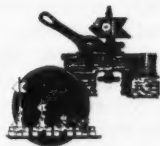
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- V. Labor Saving Devices and Methods in Roadway Work.
- VI. Economics of Roadway.
- VII. Tools and Their Uses.
- VIII. Essential Elements in Maintenance of Track.
- IX. A Program of Maintenance of Way and Track Work.
- X. The Track Obstruction.
- XI. Labor Saving Devices and Methods in Track Work.
- XII. Track Materials and Their Uses.
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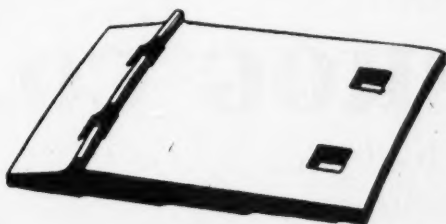
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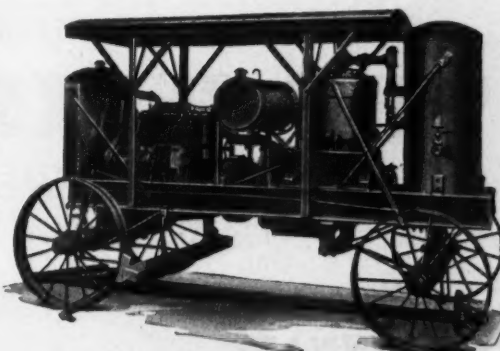
The features of the plate are—a sloping seat inclining the rail, so reducing abrasion and internal stresses in the rail to a minimum—a true camber promoting easy riding—and a bottom, as shown in the cut, so seating itself on the tie that the track is held firmly to gauge without injury to the tie.

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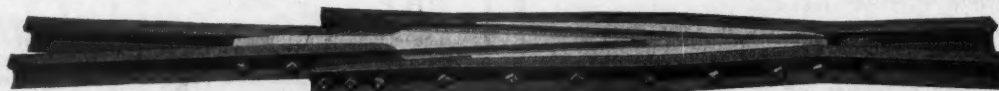
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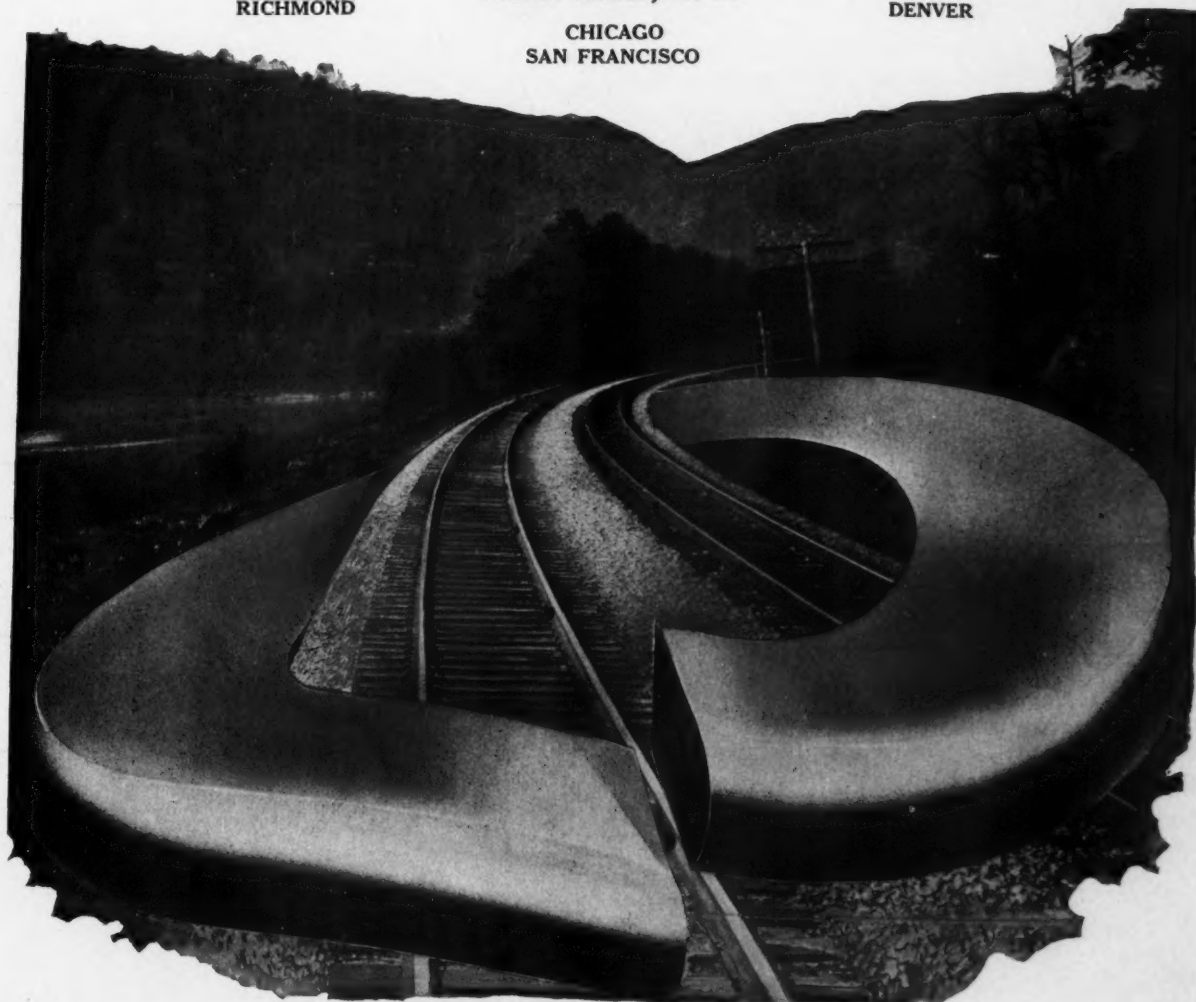
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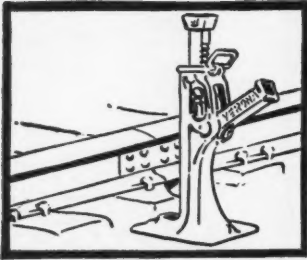
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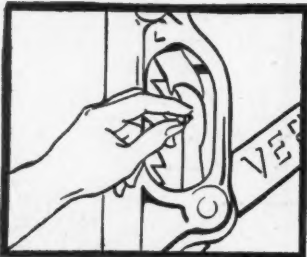


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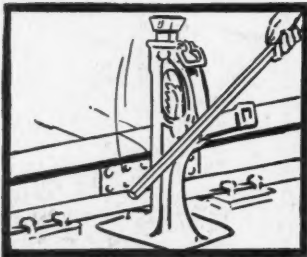
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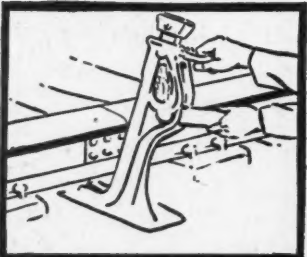
Raise your track. This jack will do it, regardless of load.



Set the trip by hand. You are now ready for any emergency.



At the approach of a train, strike the lever socket with a lining bar. The jack is tripped *instantaneously*.



The jack can now easily be pulled out of track by one man.



Five sizes.

Single and double acting.

Lifting range 6 to 18 in.

All actual 15-ton capacity.

Write for specifications.

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